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EXPERIMENTAL OBSERVATIONS ON HEADACHE*

BY

G. W. PICKERING, M.A., M.B., F.R.C.P.

Lecturer in Cardiovascular Pathology, University College Hospital

(From the Department of Clinical Research)

There are few symptoms more common or more obscure than headache. In most instances we do not know how, or from what structure, the pain arises. Partly perhaps as a consequence the diagnostic value of headache is less than in many other varieties of pain and its therapeutics is disappointing. The earlier work described the occurrence of headache in certain maladies and speculated as to its origin, but in elucidating mechanism it was relatively unproductive. In the last few years attempts have been made to approach the problem experimentally, and it is this work which I propose to discuss here.

The term "headache" is used to indicate pain felt in the region of the cranial vault. The pain may arise in several ways. Each form of headache must be considered separately, and in this account I shall not be able to discuss all. I shall do no more than refer to one of the commonest—namely, headache arising from affections of the muscles and other structures of the neck. Many of the observations described here are fragmentary, and are put forward chiefly in the hope of encouraging further work on a subject which I now find little time to pursue.

Sensibility of the Cranial Cavity

We might expect the disturbances responsible for headache to arise in the scalp, the skull, or within the cranial cavity, and it would at least give our inquiry some direction if we knew what structures in these parts were capable of giving rise to pain when suitably stimulated. The sensibility of the structures comprising the scalp and the skull would seem to be that of similar structures elsewhere in the body, and needs no special description: skin, muscle, fascia, artery, and periosteum are all painful when injured. The sensibility of the cranial content has been investigated by several neurosurgeons operating, as Lennander (1906) did, without the use of anaesthesia, or more usually with local anaesthetization of the scalp. There is good general agreement as to the findings (Fay, 1931), which have been well described recently by Penfield (1935). The brain with its enveloping pia arachnoid is completely insensitive to mechanical injury, except in the Sylvian fissure, where pain is elicited from a stimulus near the vessels. Over most of its extent the dura is also insensitive, but pain is elicited by a variety of stimuli applied along the course of the meningeal arteries and their branches and in the neighbourhood of the large venous sinuses. Pain elicited by injuring the dura near an artery is fairly well localized to the point of stimulation, whereas that from the dural sinuses tends to be felt at a distance and to be more diffuse. Traction on the falx cerebri or on the tentorium cerebelli is also painful, presumably by distortion of the venous sinuses where these expansions are attached to the parietal dura mater. In addition the dura mater at the base of the brain and the adjacent circle of Willis with its main branches are said to be sensitive, but information concerning this region is rather meagre.

To suppose that headache of intracranial origin arises chiefly from disturbances near the dural arteries or venous sinuses would be consistent with these observations on the location of pain nerves. But we cannot on this information exclude its origin elsewhere. The heart, exposed under local anaesthetization of the chest wall, is insensitive to mechanical injury, yet there is little doubt that the pain of angina pectoris and of coronary thrombosis arises within this organ. It is clear that the mechanism of each form of headache must be judged from the circumstances of its origin and its behaviour to interference.

Histamine Headache

When, after conversation with Mr. Wilfred Trotter, I first became interested in headache, the chief difficulty was to find an approach to the problem: in most pathological headaches the precise nature of the circumstances precipitating the attacks of pain is unascertained, and the skull provides an effective screen to the events taking place within.

At about that time, however, intravenous injections of histamine were being used in the laboratory to measure the circulation time, and I noticed that the injections were followed by severe headache in myself and other subjects. This substance seemed to provide an unusual opportunity of working out the mechanism of one variety of headache, since with it headache could be produced at will and under any set of circumstances of the observer's choice. In these observations (Pickering, 1933–4) I was joined later by Dr. Werner Hess. We were able to show that the histamine headache does not arise from the scalp, since it can still be produced by intravenous injection of histamine when the blood supply to the scalp has been arrested by an Esmarch bandage. That the headache arises from the meninges is suggested by its increase when the head is quickly shaken from side to side; for in such movement the brain tends to lag behind the calvarium and thus the meninges are temporarily strained.

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Further, the pain seems to arise from a structure supplied by the fifth nerve, since the histamine headache is usually confined to the normally innervated side in patients with unilateral trigeminal section. Current anatomical knowledge suggests that the dura mater is the chief meningeal structure innervated by the fifth nerve.

Histamine acts chiefly on smooth muscle which, in the cranial cavity, is confined to the blood vessels. It thus seemed probable at the outset that the headache might be due in some way to a vascular change. In response to intravenous injection of 0.1 mg. histamine acid phosphate several changes, which may be ascribed to vasodilatation, begin simultaneously in about fifteen seconds; they are flushing of the face, a fall in arterial pressure, and a rise in cerebrospinal fluid pressure due to cerebral vasodilatation. Headache begins later at about the first minute; it is maximal at about the second, and disappears about the eighth minute (Fig. 1). The head-

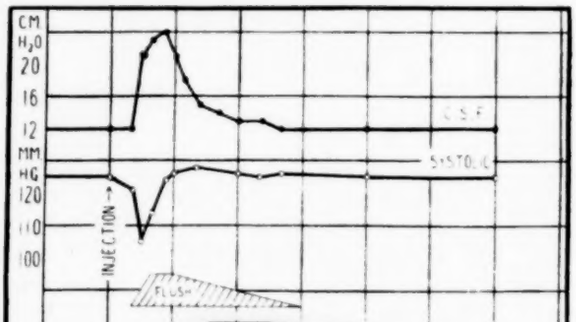

FIG. 1.—Showing the cerebrospinal fluid pressure, the systolic blood pressure, the facial flush, and the headache before and after injecting intravenously 0.1 mg. histamine acid phosphate at 0 min.

ache begins after the flush is maximal and increases while the flush is fading; it begins after the arterial pressure has recovered from its fall; it begins when the cerebrospinal fluid pressure is falling from its highest point, and it is maximal when this pressure has returned to its original level. This relation between the vascular events and headache is not fortuitous, for if histamine is infused intravenously for several minutes at a constant rate of 0.1 to 0.17 mg. per minute, then the time at which headache elects to appear is not during the infusion but a minute or more after this is stopped. Here again the onset of headache coincides with the recovery of the arterial pressure from its fall. The delay in the onset of headache effected by continuing the administration of histamine shows that the headache is not due to chemical stimulation of pain nerve endings by histamine or some product of its breakdown, and suggests that something occurs during the stage of intense vasodilatation preventing the appearance of headache. This idea is confirmed in the following way. If, when the histamine headache is at its height, a second injection of histamine is given, then the headache is abolished at the time when the face flushes and the arterial pressure falls in response to the second injection: when the arterial pressure rises again the headache returns. This effect of a second injection is due to vasodilatation, because the same transitory relief is achieved by another substance having rather similar dilator properties—namely, amyl nitrite.

Two changes occur constantly during the first phase of the action of histamine which, by altering conditions in the cranial cavity, might conceivably inhibit the development of headache; they are a rise in cerebrospinal fluid pressure and a fall in blood pressure. The effect of these changes was investigated separately. The cerebrospinal fluid pressure in the cranial cavity may be raised by injecting normal saline into the subarachnoid space at lumbar puncture; or by raising cerebral venous pressure, as in compression of the jugular veins in the neck; or by lowering the head, which raises cerebral arterial and venous pressures also. All these measures raising intracranial pressure relieve the histamine headache, but the effect is most pronounced with subarachnoid saline injection and least noticeable with lowering of the head. That the intensity of the pain also varies with intra-arterial pressure is shown by its waxing and waning with each pulse beat, and by the pain being temporarily relieved by Müller's experiment, in which forced inspiration with closed glottis results in a transient fall in arterial pressure. The most striking demonstration of the relation between intra-arterial pressure and headache is provided by an experiment which I have made on several occasions since our original observations were published (Pickering, 1933–4). If, when the headache is maximal, one carotid artery is obliterated by digital pressure low in the neck, then the headache promptly disappears on that side of the head only; when the compression is removed the pain returns with a temporarily increased intensity.

The relief of headache by a fall in pressure inside the intracranial arteries or by a rise of pressure outside them admits of one interpretation—namely, that the pain is due to stretching of some sensitive structure in the walls of the intracranial arteries or closely adjacent to them. We supposed that such stretching might result from relaxation of the arterial wall or from accumulation of perivascular fluid, but we had no evidence on which to differentiate between these possibilities. Evidence was provided later by Clark, Hough, and Wolff (1935), who confirmed our observations, and who showed that the waxing and waning of headache ran parallel to the increase and decrease in the pulsations of the cerebrospinal fluid recorded optically from the lumbar sac. They regard these pulsations as reflecting the diameter of the intracranial arteries, and the results suggest that the headache is due to dilatation of these vessels.

In the light of such experiments the course of events following histamine injection would seem to be as follows. The first phase is one in which dilatation of the small vessels predominates and in which the intracranial arteries, though probably relaxed, are prevented from dilating by the fall of arterial pressure inside and by the rise of intracranial pressure outside. During the second phase the arterial and intracranial pressures return to normal as dilatation of the small vessels subsides, and coincidently the larger intracranial arteries, whose walls are still relaxed, expand; it is this expansion which seems to give rise to headache.* Finally relaxation of the intracranial arteries passes off and headache subsides.

Observations such as these are of interest in demonstrating with some degree of probability the mechanism of one variety of headache and in showing that it is possible to attack the problem of headache by experimental means. We may now consider two forms of headache which resemble the histamine headache in certain particulars.

Lumbar Puncture Headache

A very characteristic headache occasionally occurs a few hours to a few days after lumbar puncture, and particularly, I think, when the patient has been allowed up and when several attempts have been made to enter the spinal theca. The headache is usually throbbing, and is frequently felt diffusely over the cranial vault; it may be accompanied by vomiting and by neck rigidity and other signs of meningeal irritation. The most characteristic feature of the headache is its very conspicuous increase when the patient sits up. Jacobaeus and

* In our previous article Hess and I concluded that the vessels concerned were probably the arteries of the dura mater, because of this being the only meningeal structure known to be innervated by the fifth nerve. Recently Northfield (1938) has produced experimental evidence for the view that the histamine headache arises from branches of the internal carotid artery and not from the arteries of the dura, for he has found that histamine gives rise to headache when injected into the internal carotid artery, but gives none when injected into the external carotid artery, of which the middle meningeal is a branch.

Frumerie (1923) showed that the cerebrospinal fluid pressure recorded in the horizontal position is extremely low during post-puncture headache, and attributed this to leakage of cerebrospinal fluid into the epidural space from the hole made in the spinal membrane by the first lumbar puncture. This leakage had already been suggested by McRobert (1918), and was demonstrated by Ingvar (1923) in a patient with tuberculous meningitis; it was subsequently demonstrated by Heldt (1929). Jacobaeus and Frumerie also showed that the low cerebrospinal fluid pressure was the primary disturbance in post-puncture headache, because injection of normal saline into the subarachnoid space restored the pressure to normal and abolished the headache. I have had the opportunity of confirming Jacobaeus and Frumerie's observations in the following case.

Case 1.—A young man was unconscious for three to four days following a motor accident in 1927. In 1933 he began to complain of frequent attacks of right fronto-parietal headache. He presented no signs of central nervous disease. On April 2, 1934, lumbar puncture was performed, the spinal pressure being 105 mm. H_2O. About 5 c.cm. was removed. The same evening he began to experience a severe continuous bilateral retro-orbital headache quite different from that previously experienced, and he later vomited twice. On April 4, when I saw him, the headache continued and he had slight neck rigidity. The headache was greatly increased by shaking the head; it was increased by digital compression of both jugular veins in the neck; sitting up greatly increased the intensity, the effect beginning in about five seconds and not increasing after thirty seconds. Lying down decreased the pain, the effect beginning in twenty seconds and being fully developed in forty-five seconds. Lumbar puncture was performed with the patient horizontal. Fluid was only obtained by attaching an aspirating syringe to the lumbar puncture needle, and the fluid failed to rise in the manometer tube. Injecting 12 c.cm. of warm normal saline into the spinal theca raised the pressure to 30 mm., and the headache became easier; a further 13 c.cm. raised the pressure to 45 mm. H_2O, and the patient stated that the headache had gone. He now sat up and the pain remained absent.

I have made less extensive observations on post-puncture headache in four other cases. I observed that the headache throbbed with the pulse (three instances), was increased by jugular compression (three instances), and was increased by shaking the head (two instances). In one case carotid artery compression did not affect the intensity of headache.

From the available facts it is clear that the pain is due to a mechanical disturbance occasioned by a diminution in the cerebrospinal fluid pressure in the cranial subarachnoid space, since headache is associated with low cerebrospinal fluid pressure and is abolished when the pressure is restored to normal, and since the headache is so conspicuously increased by sitting up. It is conceivable that the pain arises from widening of the intracranial arteries owing to the fall in the pressure outside these vessels. It is also possible that the pain may arise from distortion of the dura in the neighbourhood of the large venous sinuses, as by a backward and downward displacement of the brain consequent on the emptying of the subarachnoid space. If the first hypothesis were correct we should expect the lumbar puncture headache to behave to experimental interference in the same way as the histamine headache. The two resemble each other in their throbbing character, in their relief by subarachnoid injection of saline, and in their exacerbation by shaking the head. They differ in the lumbar puncture headache being more conspicuously affected by posture and being increased by jugular compression, and perhaps also in the effects of carotid compression. However, Hess and I observed that if 15 c.cm. or more cerebrospinal fluid is removed by lumbar puncture before the injection of histamine, the subsequent headache is increased by jugular compression. I am uncertain as to the explanation of this peculiar finding, but it suggests that the differences in behaviour of the two headaches may reflect a difference in the amount of cerebrospinal fluid in the subarachnoid space rather than a difference in the actual source of the pain. The behaviour of the lumbar puncture headache is, however, also quite consistent with the view that it arises from stretching of the dural venous sinuses by a hyperaemic and displaced brain, and we must leave a final decision until a more exhaustive study, including the effect of carotid artery compression, has been made.

Pyrexial Headache

Headache occurs commonly in association with pyrexia in many acute infections. I have occasionally observed the behaviour of such headaches, and have found them to behave very similarly to the histamine headache, though I have not tried carotid compression. One case of pneumonia may be quoted briefly.

Case 2.—A woman aged 53 became hot and feverish on August 28, 1932. On the next day she had a severe throbbing generalized headache which interfered with sleep. She was admitted to hospital on September 1, and on September 4 the following observations were made. Her temperature was 103°, her pulse 110; physical examination showed signs of consolidation over the upper lobe of the right lung. Headache was still present, and was relieved by jugular compression and increased by shaking the head. The pain was so severe that lumbar puncture was done. The cerebrospinal fluid pressure was 230 mm. H_2O, the fluid being normal. Injection of 20 c.cm. of warm normal saline into the subarachnoid space raised the pressure above 400 mm. and relieved the headache. Withdrawal of fluid reduced the pressure to 110 mm. and increased the pain. On September 5 the patient's temperature fell to normal by crisis. On September 20 the temperature rose again, and a dull ache without throb was experienced, and was said by the patient to be quite different from that previously felt. She was tender over the right frontal sinus, which was opaque to transillumination, as was the right maxillary antrum a few days later. On October 2 injection of histamine produced a headache which the patient declared identical with that associated with her first pyrexia.

Their similarity in behaviour to the histamine headache suggests that these pyrexial headaches are likewise due to stretching of the sensitive structures around the intracranial arteries, presumably arising from relaxation of these vessels; as yet there is no indication as to how such relaxation might arise.

Migraine

In the classical migraine attack there are three events—a visual or other aura being succeeded by headache and vomiting; but sometimes one or more of these components are absent. The headache is typically unilateral and throbbing, and is increased by movement, particularly of the head. In the two latter features it resembles the histamine headache, as it does in its relief by compression of the common carotid artery. This simple and significant observation was first made nearly 150 years ago by Parry (1792) and has since been repeatedly confirmed, but it has not received the attention it deserves, and I shall therefore quote from some of the writings describing it.

In 1867 Möllendorf wrote: "If the common carotid artery be compressed on the painful side at the level of the thyroid cartilage during the hemicranial paroxysm, so that the pulse in the temporal artery begins to fail, the headache vanishes as if by magic. . . . Unfortunately, however, with the intermission of the compression, with the first full pulse wave, the

pain begins afresh, and indeed the first pulsation will be felt to be much more painful. . . . Conversely, compression of the carotid artery of the other side enhances the pain." Wilks (1878) wrote: "Thus a pressure on the carotid in the neck will produce a suspension of the throbbing and the pain, but the effect is only for a time, as the blood soon finds its way to the head by other channels." Lauder Brunton (1908), describing observations on attacks in himself, stated: "That the pain in migraine is to a great extent due to the stretching action exerted on the contracted temporal artery by the blood which tries to pour into it from the dilated carotid is shown by the fact that if pressure be exerted upon the carotid so as to stop the pulse in the temporal artery the headache will frequently disappear instantly . . . the moment the finger is removed the pain comes back with a rush of peculiar intensity." Similar observations were described in 1905 by Hare, who found in addition that compressing the occipital, temporal, or angular arteries would relieve headache over the distribution of these vessels.

These observations, and particularly those of Hare, would seem to suggest that the headache in migraine arises from stretching the coats of the arteries of the scalp or of immediately adjacent tissues; but of the workers quoted only Lauder Brunton actually drew this inference. The idea that a vascular disturbance is the basis of headache and possibly of the other phenomena of migraine, though adopted by all these workers, has not won acceptance because of the variability in the colour and temperature of the face and in the state of the arteries of the scalp as determined by the eye and by the finger. Thus Du Bois-Reymond (1860) considered that in his own case the temporal artery on the side of the pain was contracted and the face pale, while Wilks says: "The carotid on one side with its branches throbs inordinately, is apparently very full. This I knew when quite a boy, for when leaning my head on my hand I distinctly felt the increased size of the throbbing temporal artery on the side of the pain, which would sometimes be on the right and sometimes on the left side."

In recent years the important fact has been added that the headache of migraine is abolished by intravenous, or less certainly intramuscular, injection of ergotamine tartrate. Graham and Wolff (1938) have made use of this to study the relation between the intensity of the headache and the amplitude of pulsations of the temporal artery and of the cerebrospinal fluid. They have found that after the intravenous injection of 0.37 to 0.5 mg. of ergotamine tartrate the decline of headache runs parallel to a decrease in the temporal pulse, but that the cerebrospinal fluid pulse is not consistently altered. They have also found that digital compression of the common carotid, temporal, or occipital arteries relieves the pain in the distribution of these vessels. Finally they have shown that pain arises in the distribution of the vessel when the temporal artery is exposed under local anaesthesia and distended with saline injected into the proximal end, the distal end being obliterated with the finger. They conclude that migraine headache is due chiefly to tension set up around the dilated arteries of the scalp, but they believe that dilatation of intracranial arteries may play a part, because in certain instances greater relief is afforded by compression of the common carotid than by simultaneous compression of the temporal and occipital arteries on the same side. In this connexion it would be interesting to know the effects on the pain of deliberate alteration of cerebrospinal fluid pressure by injecting saline into the subarachnoid space. Lennox (1934) and I have both found that injection of ergotamine tartrate does not diminish the intensity of headache from subsequent injection of histamine.

Although these observations suggest that the diameter of the temporal and other arteries of the scalp is an important factor in determining the migraine headache, we do not know whether the pain is due to simple arterial dilatation or whether there is another factor such as sensitization of the pain nerve endings by a chemical agent. The older writings have some doubt as to whether the temporal arteries are always dilated in migraine, and it has not yet been shown whether, in those suffering from the malady, vasodilatation of the scalp—produced, for example, by a hot bath—is necessarily accompanied by pain. We may ask, too, whether the arteries of the scalp are peculiar among the superficial arteries of the body in giving rise to pain when dilated, for we do not yet know of any comparable condition elsewhere; and we may ask what is the agent which dilates the extracranial arteries, and what is its relation to the preceding and presumably intracranial events responsible for the aura.

Raised Intracranial Pressure

The most widely held hypothesis of the mechanism of intracranial headache ascribes the pain to stretching of the parietal dura by raised intracranial pressure. The appeal in this idea lies in its accounting in a simple manner for headache being the commonest and often the earliest symptom of a number of diseases in which the intracranial pressure becomes raised. I have never been clear as to how the parietal dura can be supposed to become stretched, for it is well supported by the rigid cranium. The hypothesis does not account for the histamine headache, lumbar puncture headache, and pyrexial headache, since in these conditions, as we have seen, raising the intracranial pressure by subarachnoid injection of saline actually relieves or abolishes the pain. Nevertheless, the hypothesis must be judged on its merits.

CEREBRAL TUMOUR

Cerebral tumour is the classical example of a disease raising intracranial pressure, and, in support of the theory now being considered, provides two facts which have been widely quoted—namely, that headache is frequently abolished by decompression, and that it can often be relieved by intravenous or rectal injection of hypertonic solutions. Such few facts as I have had the opportunity of eliciting in cerebral tumour are not, however, in accord with the idea that the pain is the direct result of raised intracranial pressure. Thus I have observed two cases of temporo-sphenoidal tumour and one of cerebellar tumour, all verified at operation or necropsy, in which headache was produced or an existing headache accentuated by the removal of cerebrospinal fluid by lumbar puncture. Similar observations have been described by Ingvar. These cases are briefly as follows:

Case 3.—A steeplejack aged 30 was seen in June, 1932, complaining for twelve weeks of attacks of tingling, beginning in the right hand and involving the right half of the body; more recently his right arm and leg became weak and his speech defective. For two weeks he had experienced frequent attacks of diffuse headache lasting a few minutes to an hour and occasionally accompanied by vomiting. The headache was sometimes throbbing and sometimes not, and came and went without his knowing why. His mind was clear, but speech was halting, and he presented a right hemi-anaesthesia and right hemiparesis. There was no papilloedema. On June 7 lumbar puncture was done while he was complaining of a throbbing headache over the calvarium and worst over the forehead. The cerebrospinal fluid pressure lay between 70 and 110 mm. H_2O. Jugular compression raised the pressure to 300 mm. H_2O and relieved the headache, which returned to its original severity on release of the compression. Six c.cm. of normal cerebrospinal fluid was removed, the

pressure falling to 10 mm. H_2O; during the removal of the fluid the headache increased in severity. On June 30 a left temporal decompression by Mr. Taylor revealed an inoperable tumour deeply situated in the temporal lobe. The patient subsequently developed a hernia cerebri, and died on April 2, 1933.

Case 4.—A schoolmaster aged 28 had in January, 1934, suffered for three and a half years from headache and convulsive fits heralded by aphasia, and for four months from increasing weakness of his right arm and leg. Headache was bilateral and frontal, and occurred in paroxysms lasting about fifteen minutes. Nothing was known to provoke the pain. The patient presented bilateral papilloedema, halting speech, and a right hemiparesis. On January 31 lumbar puncture showed a spinal pressure of 320 mm. H_2O. Removal of 15 c.cm. of normal fluid immediately produced a headache of the usual kind, lasting three hours. On February 5 he was examined while complaining of headache. Compression of the jugulars relieved the pain. Lumbar puncture showed a fluid under considerable tension (lumbar pressure after removing 5 c.cm. was 250 mm. H_2O). Removal of cerebrospinal fluid increased the headache. On February 6 he became comatose, and died the next day during an operation for decompression. At necropsy a glioma about the size of an orange was found in the left temporal lobe just anterior to the basal ganglia.

Case 5.—This case was that of a boy aged 10, suffering from a glioma of the right lobe of his cerebellum, who presented gross papilloedema, and who showed throughout much drowsiness and other signs of cerebral compression. Removal of cerebrospinal fluid by lumbar puncture once precipitated and once increased his headache. Between the two lumbar punctures cerebrospinal fluid was thrice removed by ventricular puncture without any headache resulting.

In the first two of these cases the relief of headache when intracranial pressure was raised by jugular compression, and the onset or increase of headache when cerebrospinal fluid was removed and its pressure lessened, clearly show that the pain cannot have been due to simple rise in intracranial tension. The observations would be consistent with the headache of cerebral tumour being of similar origin to that following histamine, but the points of similarity demonstrated are too few to establish identity. Another mechanism which we might envisage as being brought into play particularly in intracranial tumour would be some change in the spatial relation of brain and dura mater, with consequent tension on the venous channels uniting them. Clearly we must await further evidence.*

MENINGITIS

Meningitis is another condition in which headache and raised intracranial pressure are associated. Here the headache is much more stable than in cerebral tumour, and it is a simple matter to investigate the relation between cerebrospinal pressure and headache.

A typical observation made in a woman of 48 on the ninth day of acute meningococcal meningitis is summarized in Fig. 2. At the beginning of lumbar puncture the patient complained of moderately severe headache, mainly occipital. Injection of 18 c.cm. of normal saline into the subarachnoid space raised the cerebrospinal fluid pressure to 700 mm. H_2O and greatly increased the severity of the pain; removing the injected quantity of fluid restored the headache to its original severity. Removal of a further 27 c.cm. of fluid reduced the pressure to 15 mm. H_2O and again greatly increased the headache. Injection of 20 c.cm. of anti-meningococcal serum raised the pressure to 65 mm. H_2O and restored the headache to its original severity. Observations similar to this were made repeatedly on this patient and in two other cases of meningococcal meningitis and one case of tuberculous meningitis. It will be noted that headache is increased when cerebrospinal fluid is raised or lowered sufficiently, but that it still continues at intermediate pressures. In cases where the headache is less severe it may be present only at the lower and upper pressures.

These observations offer a simple explanation for headache being usually relieved but sometimes enhanced by lumbar puncture in meningitis. The facts can scarcely be reconciled with the view that headache is due simply to raised intracranial pressure. The afferent impulses responsible for the pain evidently may arise at all levels

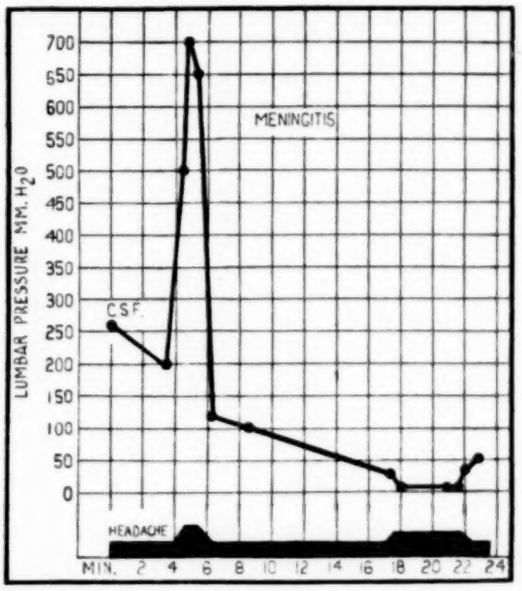

FIG. 2.—Cerebrospinal fluid pressure and headache in a case of meningococcal meningitis. (Explanation of procedure in text.)

of cerebrospinal fluid pressure, but are increased when this is very high or very low. In this condition stimulation of the pain nerve endings may be due to a chemical substance resulting from the inflammatory process. On the analogy of the experiments of Lewis and Hess (1933–4) on the skin we might imagine that such a disturbance might also sensitize the pain nerve endings in the meninges to a mechanical disturbance otherwise inadequate. The throbbing character of the pain, its susceptibility to variations in intracranial pressure, and its increase by shaking the head and jugular compression, which I have found usual in such patients, would all be compatible with some such explanation.

Traumatic Headache

This form of headache has also been supposed, without evidence, to be due to raised intracranial pressure, but Penfield (1927; Penfield and Norcross, 1936) has explained it more satisfactorily in another way. The complaints of headache and giddiness usually begin several weeks after a blow on the head. The pain is maximal near the site

* Since this lecture was delivered Northfield (1938) has published a valuable account of the behaviour of headache in intracranial tumour to experimental interference, and reference should be made to his paper for a full discussion of the subject. He has demonstrated that the occurrence of headache in tumour is not related to the height of the cerebrospinal fluid pressure, and that headache may often be provoked by suddenly raising or by suddenly lowering intracranial pressure. In many cases the headache produced by histamine accurately reproduces headaches experienced spontaneously in the course of the disease, and he concludes that the two are identical in their source. As already mentioned, he has provided evidence that histamine headache arises from arteries derived from the internal carotid rather than those of the dura, and supposes that headache in intracranial tumour arises from changes in tension in the walls of the cerebral arteries.

of the injury and spreads to a varying extent; it is commonly persistent, but may be increased by acts such as lifting heavy weights and blowing the nose. In such patients Penfield found that when he injected air into the cranial subarachnoid space by lumbar puncture the old headache usually failed to return when the pain due to air insufflation had subsided. In some patients the symptoms were unrelieved by this treatment, and in these he observed abnormalities in the cranial subdural space, whither the air passes from the subarachnoid space in the course of a few days. In some of these patients the dura was exposed by trephining near the site of the injury, the scalp alone being anaesthetized. A blunt probe passed into the subdural space encountered adhesions and, when these were near a meningeal artery, elicited pain precisely similar to that of which the patient complained. Penfield therefore supposes that the headache following head injury is due to tension on adhesions which develop between the dura and arachnoid near the site of the injury. The development of tension in the adhesions is explained as follows. When the brain is injured it swells either from haemorrhage or oedema near the site of injury and moves a little in relation to the skull; in this position the adhesions form. The brain eventually returns to its original position as the effects of injury subside and the adhesions come under strain.

Conclusions

This brief survey of the mechanism of headache will have served its purpose if it has indicated that the problem is one which will repay fuller investigation by experimental methods. Of measures which influence headache, arterial compression and the addition or subtraction of fluid to or from the subarachnoid space may be stressed because of their simplicity in execution and interpretation. Except in the case of the histamine and post-traumatic headache, the facts available are too few and too poorly established to enable us to draw any conclusions. But from the little knowledge we have it would seem probable that most headaches of intracranial origin are due to tension; and that the regions where tension may produce pain are around the intracranial arteries, as may occur when these vessels dilate—possibly also around the venous sinuses, as might occur from displacement of the brain or parts of it. Whether these are the only sources of headache of intracranial origin may be left to the future for decision.

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PELVIC DISPROPORTION

TREATMENT*

BY

J. M. MUNRO KERR, LL.D., M.D.

Emeritus Professor of Midwifery, University of Glasgow

It is common knowledge that in proportion as diagnosis becomes more exact does choice of treatment become more obvious and clear-cut: a striking example of this fact is furnished by pelvic disproportion. Obstetrics, as we have seen, emerged from the darkness of the Middle Ages with the advent of Ambroise Paré and his advocacy of podalic version in the sixteenth century. There then followed the introduction of forceps in the seventeenth century; induction of labour and symphysiotomy in the eighteenth century; and Caesarean section (modern operation) late in the nineteenth century. Let me review briefly these operations and the place they have occupied and occupy to-day in the treatment of contracted pelvis.

Version

The introduction of podalic version was a tremendous step forward: with the child's legs brought down and traction made upon them, the trunk and after-coming head could be dragged through the deformed pelvis, except in cases of extreme disproportion. And so version held its place, and the premier place, far into the nineteenth century. We find, for example, the great Simpson (Sir J. Y.) advocating version in preference to forceps in 1847. He claimed that version was the better procedure because (*a*) the head came through the contracted brim more easily base first than vertex first, as the former was the narrower part of the wedge; (*b*) there was a greater overlap of the parietal bones with an after-coming than a fore-coming head. Version, however, gradually came to be abandoned because of the high foetal mortality associated with the operation, even in cases in which there existed only a minor degree of disproportion.

Forceps

You recollect the three phases in the evolution of the obstetric forceps. First, the straight forceps with the cephalic curve invented by Chamberlen; secondly, the long and double-curved (cephalic and pelvic) forceps invented by Levret; thirdly, the axis-traction forceps invented by Tarnier in the seventies of last century and modified later by A. R. Simpson, Milne Murray, Cullingworth, and Bonney. With each of these phases in its development the forceps became more powerful as a tractor for pulling the head through the pelvic brim.

Fortunately, in most schools, both at home and abroad, the dangers of the operation were early appreciated and the era of extreme force with axis-traction forceps, and the patient in the Walcher position, was short-lived. I witnessed the birth and demise of this most dangerous operation. While dragging the foetus through the pelvic brim by axis-traction forceps is tabooed to-day, I am still of the opinion that, in special circumstances, the operation may be justified provided the operator has had considerable experience in the practice of operative obstetrics. Suppose, for example, a patient were admitted to my department advanced in labour with the child's head arrested and fixed at the pelvic brim, several exam-

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inations having been made by the midwife in attendance and one by the family doctor, who, appreciating the condition, very wisely advised her transference to hospital. Now in such a case, if after careful abdominal and vaginal examination I found that the head would come through with very moderate traction, I would probably employ axis-traction forceps. In condemning the employment of the high forceps operation it must be clearly understood that I am not taking exception to the employment of forceps once the head has passed the obstruction. On the contrary, the low forceps operation is very frequently indicated if the head has been long delayed in its passage through the pelvic inlet.

Symphysiotomy

There is general agreement that symphysiotomy or pubiotomy should also be excluded in respect to inlet deformity. On the other hand, I and a few other obstetricians—not many, I admit—are convinced that these operations may on occasion be employed with great advantage for outlet deformity; to this matter I shall return later.

Induction of Labour

Induction of labour in a primigravida of the borderline group should also be excluded, except under special circumstances. Obstetricians in every country except Great Britain look upon it with disfavour; but I am glad to find that even in our country the advocates for induction of labour in primigravidae become fewer every year.* In borderline cases, as we have seen, it is impossible to predict at the thirty-seventh week what adjustments of head to pelvis may occur, and how effective the forces may be when labour comes on. Furthermore, the foetal mortality (stillbirths and neonatal deaths included) is high with induction of labour in primigravidae—you cannot reckon on a death rate of less than 10 to 15 per cent. It is quite another matter, the employment of induction of labour in multigravidae, in whom you have the previous labours on which to make a decision for or against this operation. We have therefore reduced treatment to two procedures: (1) permitting labour to take its course—so-called "trial of labour"; (2) Caesarean section.

Trial Labour and Spontaneous Delivery

With the onset of labour there occurs a slight "give" in the pelvis, softening of cervix and surrounding tissues, and moulding and adjustment of the head to the pelvic brim. In consequence it now becomes possible to determine, with much greater exactness than could be attained before, the relative disproportion of head and pelvis. Furthermore, there is also the possibility of estimating the character and strength of the expulsive forces. For these reasons, therefore, all obstetricians who have had an extensive experience of contracted pelvis advocate a trial of labour ("trial labour"). They claim that if this method of treatment is judiciously employed it gives outstandingly good results in respect to both mother and child. If the figures of large maternity hospitals (all countries included) in which this treatment is wisely employed are examined, it will be found that spontaneous delivery (with perhaps a little assistance with forceps at the outlet) is attended with an extremely low maternal and foetal death rate. There are records of series of many hundreds of cases in which there was no maternal death, and a foetal death rate of not more than 2 to 3 per cent., if disease, malformation, and marked prematurity of foetus are excluded, as they should be, when assessing the dangers of this particular treatment.

Some critics of the procedure maintain that the "trial labour" is a confession of failure on the part of the accoucheur to make an exact diagnosis; while others object to it because of the danger to the child. The former obviously fail to appreciate the finer points in diagnosis and treatment; the latter have been answered in the preceding paragraph. I do, however, admit that if trial labour is employed beyond rational limits the child may suffer; but every treatment has its limitations. The first and most important lesson the practising obstetrician has to learn is to appreciate the advantages, the disadvantages, and the limitations of each and every operative procedure. To return to the "trial labour"—what, I ask, is the alternative? I have already indicated the objections to induction of labour in primigravidae; consequently the only alternative is Caesarean section. If this course is followed, 80 to 90 per cent. of Caesarean sections will be performed unnecessarily in "borderline" cases.

Having said so much in favour of the "trial labour," I would point out that it is *employed on the understanding that at any time in the course of the labour intervention by Caesarean section may be necessary*. My experience is that, given good uterine contractions, Caesarean section has been necessary in 6 to 10 per cent. of the selected borderline cases allowed to go into labour under the expectation that spontaneous delivery would occur, or an easy delivery with forceps at the outlet would be sufficient. Obviously, therefore, with the possibility that Caesarean section may have to be employed, the management of the "trial labour," more especially in respect to the employment of sedatives and vaginal examinations, must receive special consideration.

Conduct of Trial Labour

It is advisable to hold your hand as regards the giving of sedatives: more freedom is permissible when it becomes certain that the head is adjusting itself to the pelvis and passing downwards. The procedure should be to try to secure strong uterine contractions by removing fear or nervousness, and by distracting the patient's attention during the intervals between the pains. On many occasions I have said to a patient, "Look here, we are going to get this labour through without Caesarean section." It is wonderful how a patient will co-operate if given encouragement. Undoubtedly you are quite often "let down" by failure of the forces; but within an hour or two you can generally tell if the uterine contractions are going to be adequate. I know of no drug which increases the strength of uterine contractions and is at the same time safe. Jeffcoate (1938), in his recent Blair-Bell Memorial Lecture, stated that response to oestradiol benzoate or oestrone given intramuscularly was disappointing in cases complicated by mechanical obstruction. If, then, it becomes apparent that the uterine contractions are not going to "rise to the occasion," the sooner Caesarean section is performed the better.

It is customary to make a vaginal examination early in labour for the purpose of excluding prolapse of cord, which is liable to occur in the circumstances. If the cord is found "presenting" or prolapsed, and pulsations in it are good, Caesarean section should be performed. The examination should be made under "gas-and-oxygen," because under anaesthesia precautions against infection can be better carried out, and a more exact estimate of

* The motion "That induction of premature labour should not play any part in the treatment of pelvic contraction or disproportion in primigravidae" was carried by a large majority. (*Proc. roy. Soc. Med.*, 1936, **29**, 1473.)

the relative size of head and pelvis made. Some obstetricians, however, in their desire to dispense with a vaginal examination early in labour, are prepared to risk the accident of prolapse of the cord: over a long series of cases this omission might affect adversely the foetal mortality by 1 to 1.5 per cent.; that has been my experience. The size, consistency, position of head, and the direction of the sagittal suture should be noted.* If the sagittal suture is occupying the middle line of the pelvis or is directed towards the sacrum (anterior parietal presentation), and certainly if the head, grasped by the external hand, can be made "to bite" into the pelvic brim, there is every likelihood that the head will pass into the cavity. If, on the other hand, the overlap is more pronounced and the sagittal suture continues nearer the symphysis (posterior parietal presentation), the prospect of descent of the head is definitely less likely. Consequently in the latter event the overlap must be carefully noted by external palpation every half-hour or so. If it becomes more pronounced, even indeed if it persists, further trial of labour should be abandoned and Caesarean section performed without delay. At this stage I have very rarely succeeded in converting a posterior into an anterior parietal presentation.

If a complete examination as described above has been made, the progress of labour can be followed by palpation and auscultation. The head, if it is going to pass, becomes more fixed and the overlap disappears. In the case of the flat rachitic pelvis, descent of the head into the pelvic cavity may occur quite suddenly during a pain. In some instances a second vaginal examination may be necessary if doubt exists as to the progress of labour. In that event the patient should be prepared for Caesarean section, be anaesthetized with "gas-and-oxygen," and a final decision be made as to whether labour should be permitted to continue still longer or Caesarean section performed immediately.

In the preceding remarks on the conduct of the "trial labour" no reference has been made to the position of the patient or to "postural treatment." With the object of increasing the conjugate diameter of the brim (C.V.), some authorities claim that the Walcher position may be employed with advantage. The Walcher position, however, while it increases slightly the conjugata vera, increases also the obliquity of the pelvic brim, and this may more than outweigh the advantage of the slight pelvic increase. Besides, the position, being uncomfortable and disturbing to the patient, may inhibit the strength of the uterine contraction. A modified Walcher position with the patient's feet resting on a stool nullifies almost entirely any gain: it is the weight of the hanging legs depressing the ossa innominata that brings about the increase in the conjugate diameter of the brim.

Once the head is through the brim and has descended into the cavity a little time should be given to see if the forces unaided will expel the child. Very often it is advisable to deliver with forceps; but it is better to wait until the foetal heart has recovered its normal rate, which is often disturbed as the compressed head is passing the obstruction.

It will be realized that the conduct of a trial labour calls for judgment and great patience. Obstetricians who possess neither can never gain experience in the conduct of an obstructed labour due to pelvic disproportion: they will continue to perform unnecessary Caesarean sections, smug and self-satisfied in their ignorance of the finer points of obstetric practice.

* When labour begins (pelvis and head normal) the foetal head is generally lying with its long axis corresponding to the transverse diameter (longest diameter) of the pelvic brim and with the posterior parietal bone presenting. Gradually the anterior parietal bone sinks down behind the symphysis. This has been demonstrated by radiographs taken during labour.

Caesarean Section

Caesarean section in respect to contracted pelvis is indicated where a live child cannot be born, or the dangers are too great to permit of its being born, *per vias naturales*; and in the case of a dead child where the risks from craniotomy are greater than those from Caesarean section. A description of Caesarean section and a discussion of its technique do not fall within the purview of these two lectures. I do, however, wish to stress the advantages of the "lower segment operation," which I have advocated and employed for well over twenty years.

Craniotomy

Theoretically, craniotomy should only be performed if the child is dead; but as the results from Caesarean section, where the operation is done after unsuccessful attempts at delivery with forceps ("failed forceps"), show a relatively high maternal mortality rate, it is questionable if it is right to subject those women to the major operation. Besides, the foetal death rate—early and late—is very high in such cases (20 to 30 per cent.). Some, however, hold the view that under no circumstances should a living child be destroyed. The question, however, is not suitable for discussion here.

Obstruction More Particularly Affecting the Pelvic Outlet

Once or twice in the course of these two lectures I have indicated that deformities of the pelvic outlet may constitute a special problem, distinct and apart from that presented by deformities of the inlet, the diagnosis and treatment of which have been clarified and simplified in recent years, as I have explained. I feel convinced that in the future, however, more attention will be given to outlet deformities and dystocia resulting therefrom. They take a considerable toll in foetal deaths and are responsible for not a few maternal deaths. This is largely because outlet deformities are overlooked or are considered of minor importance. As examples of obstructions particularly confined to the outlet you have the funnel-shaped, kyphotic, and flat non-rachitic pelvis; and in addition the pelves grouped under "minor variations of female pelvic formation" such as those of the android and anthropoid types. In any of these pelves the head may descend to the outlet and be arrested there, although the expulsive forces appear to be of normal strength.

I must, of necessity, be brief in discussing diagnosis and treatment of outlet deformities—very much briefer than the subject warrants. I pointed out earlier that mensuration of the pelvic outlet can be made with great exactness by hands and callipers—indeed, a radiograph of the outlet is seldom necessary. I do admit, however, that a lateral radiograph and a good stereoscopic view of the cavity and outlet may be of great value in some instances. Malformations of the pelvic outlet are inextricably mixed up with "persistent posterior positions" of vertex and "deep transverse arrest" of head. But I have seen cases—in which the long axis of the head was lying in the conjugate diameter with the occiput anterior at the outlet—that could not be delivered by forceps. Here is one; I quote it in the last edition of *Operative Obstetrics* (1937). The patient had a kyphotic pelvis and the head was visible

when the vaginal walls were retracted. My house-surgeon was proceeding to apply forceps when I entered the labour room with my students. When I examined the outlet I knew the head could not be extracted. I divided the symphysis, following which my house-surgeon was able to complete the delivery with the greatest ease. The kyphotic pelvis in which the interischial diameters are so narrow that the head cannot be delivered is comparatively rarely encountered. In most instances the deformity is not extreme, and generally the child is small.

In my experience the worst cases of outlet dystocia have been those associated with "deep transverse arrest" of the head. It is inevitable if the sacral curve is very flat (the "flat non-rachitic pelvis"). I have seen several examples of this most troublesome complication, and on occasion have found it impossible to effect rotation manually and deliver with forceps, or to rotate the head with forceps. There is another type of pelvis which those who have studied outlet dystocia by means of radiography claim to be a common cause of "deep transverse arrest"—namely, the android pelvis. I can well understand this; but I cannot speak from personal experience because I had retired from practice before I was able to make many observations with this advanced pelvic radiography as a diagnostic aid.

Those who have had considerable experience of pelvic radiography give us this comforting information—and I am convinced they are right—that the anthropoid type of pelvis need cause little concern. The incidence of this type of pelvis has not been assessed for our country as a whole, or for any locality. Thoms (1937), Caldwell and Molloy, and others in the United States have found the incidence to be 15 to 17 per cent. for the white population and over 30 per cent. for the negro population. In a large proportion (30 to 40 per cent.) of patients with pelves of anthropoid form an occipito-posterior position develops and becomes persistent. Unless, however, the fore-pelvis is very narrowed, spontaneous delivery "face to pubes" is frequent, and if forceps is necessary delivery "face to pubes" is easy. My clinical experience goes to support this—not the association with anthropoid pelvis, but the fact that some deliveries face to pubes are easy and others difficult irrespective of the factor of size of foetal head. Now, there is a very important practical deduction from this. If an anthropoid pelvis is known to exist from the pelvic radiograph there is no need to rotate the head manually or by forceps—indeed, it may be a mistake to do so. The interests of mother, and especially of child, may be better served by leaving the case to Nature as in the ordinary gynaecoid type, in which long rotation forwards occurs in over 90 per cent. of cases.

And now I am going to spring a surprise—I advise the *judicious employment of symphysiotomy or pubiotomy*. It is preferable to Caesarean section where the head is fixed at the pelvic outlet. You cannot employ the lower segment incision in this event because of the difficulty in removing the child. Besides, the labour has been going on for long and possibly several vaginal examinations have been made, and manual corrections may even have been attempted. By all means choose Caesarean section if beforehand you know it is almost a certainty that there will be great difficulty in the delivery per vaginam because of the outlet deformity. Let us consider symphysiotomy for a moment. I know the operation is looked upon with disfavour by most obstetricians, but I have satisfied myself that *it is a wise procedure in certain cases of outlet dystocia*: please note, outlet dystocia, not inlet dystocia. I have had personal experience of this operation: few of my critics can say that they have ever performed the operation or seen it performed. If symphysis or pubic bone is divided, every centimete of separation of pubic bones increases to a like extent all the transverse diameters of the pelvis. This greatly facilitates intrapelvic manipulations and forceps delivery.

There is one other matter to which I feel I must make reference—breech presentations with known pelvic distortion. Unless the distortion is of a very minor degree I advise Caesarean section. No attempt at external version before labour should be made.

So you see—and on this note I conclude these two lectures—how clear and well defined is the treatment of pelvic disproportion, provided there is exactness in diagnosis. This can now be ensured—to a degree never before possible—by ordinary old-time methods, supplemented by judicious employment of radiography. And just one word more. It is satisfactory to learn that the exact observations of pelvic formation by radiography carried out by those who have had experience of them have not lessened the employment of "conservative methods" of delivery. On the contrary, the rates for Caesarean section and for forceps delivery have fallen in the clinics in which meticulous exactness of diagnosis has been striven after.

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HAEMATEMESIS AND MELAENA

OBSERVATIONS ON THE USE OF CONTINUOUS DRIP TRANSFUSIONS

BY

F. AVERY JONES, M.D., M.R.C.P.

Second Assistant to the Medical Professorial Unit, St. Bartholomew's Hospital

This report illustrates the results which may be obtained in severe and repeated haematemesis by the prevention of dehydration, by liberal feeding, and by the use of continuous-drip blood transfusions. During the past four years all cases of haematemesis and melaena admitted to the medical professorial unit at St. Bartholomew's Hospital have been treated medically on the lines instituted by Professor Witts in 1935 and described by him in 1937; in no case was surgical intervention advised for arrest of haemorrhage. This series consisted of sixty-five consecutive cases, including the twenty-six already described by Witts (1937). Of the total, seven were due to cirrhosis of the liver and two to carcinoma of the stomach, and six patients left hospital before an accurate diagnosis could be established. The remaining fifty patients bled from acute or chronic ulceration; they form the subjects of this report, and include thirteen with severe and repeated haemorrhage. The severity of these thirteen cases may be judged from the details given in Table I.

Recurrence here refers to signs and symptoms of acute haemorrhage not less than twenty-four hours after a previous haemorrhage. In some cases there was also persistent slow bleeding. Two comments may be made on the table. In one patient the lowest haemoglobin recorded was 50 per cent. This was estimated before full dilution of the blood could have occurred, because the rise in the haemoglobin after the transfusion was 20 per cent. less than expected. The lowest haemoglobin reading

in the table is 24 per cent. Lower figures were prevented in all probability by the drip transfusions, which were usually given if the haemoglobin fell below 40 per cent.

TABLE I.—*Particulars of Thirteen Cases of Severe Haematemesis*

Sex	Age	Diagnosis	Lowest Hb %	Highest Blood Urea mg. per 100 c.cm.	Recurrences	Blood Transfusion c.cm.
Female	69	Erosive gastritis	29	280	4	3,950 Died
,,	50	Subacute G.U.	33	45	6	6,735 (Chart)
Male	53	Acute ulcer	24	84	3	6,700
,,	49	Chronic D.U.	27	108	3	7,150
,,	61	Acute ulcer	26	132	3	2,200
,,	48	,,	50	116	2	2,810
,,	51	Chronic D.U.	33	96	3	600
Female	44	Acute ulcer	30	84	1	1,050
Male	48	,, ,,	33	78	4	600
,,	39	,, ,,	41	86	2	600
Female	47	,, ,,	39	78	1	—
Male	54	Chronic G.U.	40	80	2	—
,,	49	Chronic D.U.	33	168	2	—

Out of the fifty patients with simple peptic ulceration one only died. She was a woman of 69, and at necropsy a severe erosive gastritis was found. Although perhaps it is not permissible to draw conclusions from so small a series, one death in fifty cases of bleeding from peptic ulceration, including thirteen with severe and repeated haemorrhage, of which ten had three or more haematemeses, compares favourably with the results in other series treated medically or surgically: in cases from the same hospital Cullinan and Price (1932) recorded twelve deaths out of twenty-one cases of haematemesis that recurred more than once. In the present series patients received at least 2,700 c.cm. of fluid daily, and, in addition, semi-solids were allowed from the time of admission. Dehydration, so common under the old regime, was almost entirely eliminated, and there is no evidence to suggest that the liberal feeding was anything but beneficial. This aspect has been discussed at length by Witts (1937).

Indications for Transfusion

✓ It is the experience with drip blood transfusions that I wish to place on record. There have been two main indications for transfusion. If there was severe shock, with the systolic blood pressure below 90 mm. Hg and the pulse above 120, a transfusion was given, whatever the haemoglobin percentage might be; for such patients, if left too long, may pass into a state of secondary haemorrhagic shock from which transfusion may fail to save them. Again, if the haemoglobin fell below 40 per cent. the patient was transfused, since the clinical condition may deteriorate rapidly if haemorrhage recurs in a patient with this degree of anaemia. If the haemoglobin fell below 40 per cent. but there were no symptoms to suggest continued bleeding, then 600 to 1,200 c.cm. of blood were given by the drip technique. If the haemoglobin was below 40 per cent. and there were indications of continued bleeding, then the drip was maintained until all signs of bleeding had ceased and this could be proved by a rising haemoglobin. In this way 1,500 to 3,000 c.cm. of blood have been given.

A strong prejudice exists against transfusion for gastro-duodenal haemorrhage. There is evidence to suggest that an ordinary transfusion given soon after the haemorrhage will provoke further bleeding in 50 per cent. of the cases; if, however, it is given when bleeding has stopped, there is no tendency for further haemorrhage to ensue (Cullinan and Price, 1932). An ordinary transfusion of 300 to 600 c.cm. of blood is made in fifteen to thirty minutes. To give the same amount by the drip technique of Marriott and Kekwick (1935–7) will take three to six hours. It is of importance to discover whether or not this is an advantage in transfusing for gastro-duodenal haemorrhage. Two aspects of the problem must be considered. Is a drip transfusion less likely to provoke further bleeding than an ordinary transfusion, and is it safe to give several pints? Does bleeding stop if a drip transfusion is begun?

Blood-pressure Changes after Haemorrhage and Transfusion

Recurrence of haemorrhage may be due to further erosion of the bleeding vessel or to displacement of the clot, possibly by an increase in blood pressure. Attention has therefore been paid to the blood-pressure changes after haemorrhage and after transfusion. In my experience, after a small haematemesis the blood pressure was usually within normal limits, or even slightly raised. This is in accordance with experimental work in animals, where the blood pressure is at first well maintained after haemorrhage (Meek and Eyster, 1921). With a rapid moderately severe bleeding the patient passes into a shocked state, sweating freely. The systolic blood pressure is below 90 mm. Hg and the pulse often above 110. If given the usual treatment, after one-half to one hour the blood pressure begins to rise and the pulse rate falls, and within six to twenty-four hours there is usually a noticeable increase in pallor. By this time the percentage of haemoglobin is falling, from dilution of the blood and return to the normal blood volume. In some cases the pallor is out of proportion to the haemoglobin reading, and it is at this time that an increase in blood pressure may be found: almost without exception the highest blood-pressure readings recorded in these patients have been observed within six to twenty-four hours of a haemorrhage. In over a quarter of the cases the blood pressure was apparently raised. The blood pressure is so labile in normal people that this observation might be discounted as an emotional reaction to the sphygmomanometer. It is difficult, however, to do so in these cases, for when the blood pressure is taken at frequent intervals a steady rise and fall extending over many hours may be found, as in the case of a man aged 42 with acute ulcer, who was admitted one day after haemorrhage with a blood pressure of 160/65, which on subsequent days was 160/65, 120/70, 120/70, and 120/70. This rise and fall is not due to the journey to hospital, for it is seen after recurrent bleeding in the wards, as shown in the following case:

A man aged 35 with duodenal ulcer had a haematemesis in the out-patient department. His blood pressure one hour later was 106/70, and at midnight, after a second haemorrhage, it was 95/50. At 2 a.m. it had increased to 136/85, and at 10 a.m. to 150/88. On the following days it fell to 140/68, 120/65, and 118/64.

The phase of reactive hypertension is well seen in the accompanying chart. It shows that the blood pressure rose sharply within an hour of the start of the first drip transfusion to a peak of 150 mm. Hg. This might have been attributed to the transfusion, but a similar transient hypertension occurred on the eighth day, again after haemorrhage, this time without transfusion. On the

thirteenth day there was further severe bleeding, and a drip transfusion was begun. Although 2,650 c.cm. of blood was then given the blood pressure did not rise above 118 mm. Hg. It is possible that the large transfusion prevented the phase of hypertension, which had been observed twice previously.

There have been few opportunities for observing the blood-pressure changes following ordinary transfusions

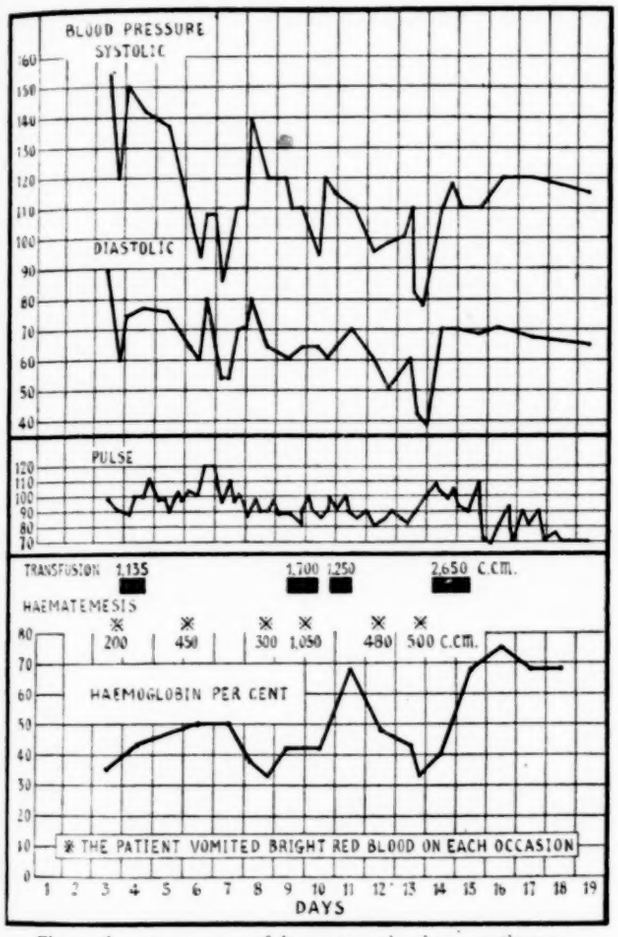

Chart of a severe case of haematemesis given continuous-drip transfusion.

given soon after a haematemesis. It has been mentioned that such transfusions tend to provoke further bleeding. A possible reason for this would be a sudden increase in blood pressure associated with the injection of 300 to 600 c.cm. of blood in fifteen to thirty minutes. Such a sudden increase was actually observed in one case.

Blood-pressure Changes following Continuous-drip Transfusion

A number of observations have been made on the blood-pressure changes with continuous-drip blood transfusions, and they are recorded below (Table II). Except in the one case already discussed, any change in blood pressure has been gradual, and there have been no sudden fluctuations during any transfusion when detailed records have been made. It will be noticed that many of the transfusions were given rather more rapidly than advised by Marriott and Kekwick.

These observations suggest that a drip transfusion does not produce any rise of blood pressure other than might occur without transfusion. Drip transfusion does not tend to provoke further immediate haemorrhage, which occurred in one case only, and there is no evidence that it is haemostatic in action, but the signs of bleeding may cease while the patient is undergoing drip transfusion.

The observation that some of the patients bled three or more times and on each occasion had to be transfused must not condemn this therapeutic measure. In the past the mortality in cases of recurrent haemorrhage has been

TABLE II

Case No.	Volume of Blood Given	Time Taken	Blood Pressure	
			Before	After
1	2,810 c.cm.	25 hours	104/63	102/60
2	750 ,,	4 ,,	112/52	110/60
	2,300 ,,	14 ,,	84/46	120/64
	1,300 ,,	8 ,,	118/60	120/64
	2,800 ,,	18 ,,	120/64	110/60
3	1,200 ,,	7½ ,,	60/42	115/68
4	1,200 ,,	8 ,,	98/54	128/72
5	3,100 ,,	28 ,,	58/?	100/56
6	1,135 ,,	19½ ,,	118/60	142/76
	1,700 ,,	21 ,,	120/64	120/60
	1,250 ,,	14 ,,	116/64	110/70
	2,650 ,,	23 ,,	76/36	110/68
7	1,200 ,,	19 ,,	124/60	130/60
8	1,200 ,,	6½ ,,	110/	105/
	1,800 ,,	15 ,,	120/	140/
	3,000 ,,	20 ,,	106/	135/

extremely high. It is interesting to note that in three cases in which haemorrhage had already occurred several times a slow transfusion of over 2,400 c.cm. of blood was not followed by further bleeding and the patient made a rapid convalescence. It may be necessary to persevere and give several transfusions, but in most cases the bleeding will ultimately stop. In three patients it was necessary to give over 6,000 c.cm. of blood.

Conclusion

The technique of Marriott and Kekwick is so simple and the apparatus so inexpensive that with it institutional treatment is not necessary. It is not even essential to cut down on the veins if the special needle introduced by Waring (1938) is used. The difficulty, of course, is to secure a sufficient number of donors. This has been achieved by the full use of relatives and fellow employees, and by the generous assistance of the British Red Cross Society Transfusion Service. It may be argued that the larger drip transfusions may increase the blood volume. If begun soon after the haemorrhage it is probable that this increase is small, for it must be remembered that the blood lost in these severe cases is about two or three litres. One of my observations, nevertheless, suggests that there was a slight rise in the blood volume after a drip transfusion of 3,000 c.cm. The haemoglobin percentage increased from 28 to 75 during the transfusion, but rose a further 8 per cent. in the following twenty-four hours, and so during this time there must have been a decrease of plasma volume, associated with the 8 per cent. rise in haemoglobin. As there was no abnormal rise in blood pressure and no cardiac embarrassment it is difficult to see how the temporarily increased blood volume was harmful.

It was found that the clinical response of the patient to the haemorrhage or to the transfusion could be well followed by charting the pulse frequency, the blood pressure, the haemoglobin percentage, and the blood-urea values. It was thus possible to obtain an indication of the severity of the haemorrhage, and to tell whether or not the haemorrhage had ceased. Much emphasis has recently been laid on the value of blood-volume estimation in determining these two points (Izod Bennett *et al.*, 1938). These estimations are of great interest, and may be of practical value, but for planning treatment and judging the clinical response it would appear that enough information may be gained by the simple measures described above.

Summary

A series of fifty cases of haemorrhage from simple peptic ulceration is reported. There was only one death, although there were thirteen cases of severe repeated bleeding.

This low mortality rate is attributed to the liberal feeding of the patients and to the use of continuous-drip blood transfusions.

Drip blood transfusion does not provoke further immediate haemorrhage.

After haemorrhage there may be a transient phase of reactive hypertension, but there is no evidence that a drip transfusion produces any abnormal increase in the blood pressure.

It is suggested that a sufficiently accurate indication of the progress of a patient may be gained by charting the blood pressure, pulse frequency, haemoglobin percentage, and possibly the blood-urea values.

My thanks are due to Professor L. J. Witts and Professor R. V. Christie, on whose patients these observations were made, for their interest and assistance in this paper. I am grateful for helpful criticism from Dr. G. Graham, Dr. Geoffrey Evans, Dr. H. L. Marriott, and Dr. R. Bodley Scott.

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The April issue of *The Mission Hospital* has an article on pioneering among the Nuers of Zeraf Island in the Southern Sudan, which reveals how the struggle for existence is being eased by public health activities and, more particularly, by an intensive campaign against mosquitos, flies, and white ants, associated with the prevention of such diseases as trachoma; this work is carried on in dispensaries built of mud and surrounded by a most apathetic and ignorant population. In contrast there comes news from Travancore of the opening of a fine new rural medical mission, replacing a tiny thatched shed, which will now serve as a ward with one or two beds, the scheme being the forerunner of a hospital compound, including a child welfare centre. The uphill work going on in Palestine, in the face of increasing unemployment and poverty caused by political strife, is also described by the medical officer at Nablus, which has been for long a stronghold of Moslem Arabs. These and other articles illustrate how the days of pioneering are not over for medical missionaries, and the possibilities of conducting a large practice with the aid of tents, lorries for hospitals, and river boats for dispensaries are indicated. The jubilee of medical missions as a component part of the Church Missionary Society is due in two years' time.

THE MORTALITY OF CHILDREN IN ENGLAND AND WALES AND GERMANY

A STATISTICAL COMPARISON

BY

GUSTAV TUGENDREICH, M.D.

It has long been recognized that study of rates of mortality in different countries at approximately the same levels of sanitary development is an important duty of the intelligence service of a Public Health Department. No two systems of public health services are identical, and variations in rates of mortality may throw light upon their respective efficiencies. These considerations apply particularly to rates of mortality in early life, when it is reasonable to believe that good or bad environmental factors exert their greatest power.

While working in the Statistical Department of the London School of Hygiene and Tropical Medicine I was struck by the excessive mortality from measles which characterized England and Wales as compared with Germany. Although the population of England and Wales is little more than 60 per cent. of that of Germany, in the years 1921–30, 42,450 deaths were assigned to measles in England and Wales and 39,740 in Germany, while in the quinquennium 1931–5 England and Wales had 13,750 deaths and Germany only 7,506. I was, of course, aware that the periodicity of epidemic measles makes comparison of short series of years dangerous, while differences in the practice of certification and classification to single causes in different countries are always stumbling-blocks of international comparisons. But examination of the official rules for classification in use in the respective Government Departments did not suggest that there was any gross fallacy of comparison, and led me to conclude that Sieveking was justified in his remark (*Der öffentliche Gesundheitsdienst*, **2**, 1936–7, p. 380) that measles has not in Germany the serious character which causes the disease to be feared in England. On working out the actual rates of mortality for each of the five years 1931–5, it appeared that, although in every age group the English rate of mortality was the higher, the excess in the age group 1–5 was particularly striking. At the best (1935) it was nearly twice as high as the German rate, at the worst (1931, 1932, and 1934) some five times as high. This especially unfavourable position of children of pre-school age in England and Wales led me to examine the statistics of child mortality in further detail. I propose here to give a summary of the most striking features, reserving a detailed examination for another occasion.

I begin with rates of mortality from all causes in the first year of life. As within the quinquennium 1931–5 there were relatively large variations in the numbers of births, particularly in Germany, the conventional method of statement of mortality rates in terms of annual live births is not quite satisfactory. But as recalculation of the English rates in terms of quarterly births did not seriously affect the results the usual method may stand.

TABLE I.—*Rates of Mortality from All Causes per 1,000 Live Births in England and Wales and in Germany*

Months of Life	1931		1932		1933		1934		1935	
	E.&W.	G.	E.&W.	G.	E.&W.	G.	E.&W.	G.	E.&W.	G.
0–1	31.6	42.9	31.6	41.9	32.2	41.5	31.3	36.6	30.4	36.2
1–3	10.9	13.9	10.8	14.6	9.9	12.7	8.8	11.8	9.1	11.4
3–6	9.9	13.3	9.2	12.4	8.8	11.9	7.5	11.0	7.7	10.9
6–9	7.4	8.2	7.2	7.9	6.3	7.7	5.8	7.1	5.4	6.9
9–12	6.8	5.5	6.3	5.2	6.0	4.9	5.1	5.0	4.3	4.6

TABLE II.—*Approximate Rates of Mortality from All Causes per 1,000 Living (Persons)*

Age in Years :	0–	1–	2–	3–	4–	5–	6–	7–	8–	9–10
England and Wales	61.4	12.9	5.6	4.2	3.3	2.8	2.4	1.9	1.6	1.4
Germany ..	90.0	9.0	4.5	3.2	2.6	2.2	2.1	1.9	1.6	1.5

TABLE III.—*Death Rates from Selected Causes of Death at Different Ages in England and Wales for the Years 1932–5 expressed as Percentages of those in Germany. (Germany = 100 per cent.)*

Age Groups :	0–1								1–4								5–14							
Disease group	1932		1933		1934		1935		1932		1933		1934		1935		1932		1933		1934		1935	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Infectious disease	119	119	95	92	106	112	72	79	208	205	151	205	179	188	105	106	120	119	111	115	63	73	82	76
Nervous system	34	30	36	34	48	45	46	44	77	85	77	85	72	62	69	68	144	127	131	148	129	132	101	110
Respiratory system	113	105	107	106	112	110	98	101	187	199	187	199	170	170	117	125	147	180	133	164	134	133	107	100
Digestive system	83	77	101	94	83	85	81	77	107	125	107	125	115	96	108	107	97	93	64	69	94	86	76	76
All causes (persons)	82		83		89		83		151		140		141		103		121		128		111		94	

The rates are in Table I. It will be found that though down to the sixth month of life the English rates are distinctly favourable they then worsen, and in the last quarter of the first year of life exceed the German rates. The swing is considerable—from a deficit of some 20 to 30 per cent. in the first six months of life to an excess of 10 to 20 per cent. in the last quarter of the first year. The apparent advantage of England and Wales in the year 1935 in the fourth quarter of the first year of life may well be due to the imperfect method of estimating the rate, for in Germany births increased largely in 1934 and 1935.

A comparison of the quinquennial rates at ages 1–5 showed again an advantage for Germany, but I desired to make a finer comparison. As the German data are not subdivided in the same way as the English data, which show rates at ages 1–2 and 2–5 years, I made the following rough experiment. I related the deaths as published in England and Germany in single years of age for the triennium 1932–4 to, respectively, (1) the estimated populations at single years of age as given by the English Registrar-General, and (2) the enumerated populations of the German Census of 1933. One has then the figures of Table II. From the second to sixth year of life the German advantage is substantial; the English rate of mortality in the second year is more than 40 per cent. greater than the German rate, and from age 2 to 6 it is still some 25 to 30 per cent. in excess.

For the whole of the first year the ratio of mortality calculated in this way is, on the other hand, 32 per cent. in favour of England. Owing to this, and especially to the great English advantage in the first months of the first year of life, when mortality is at a maximum, it would still be true, in spite of the relatively high rates in England in later childhood, that the proportion of live-born children surviving to the age of 10 would be slightly greater in England (very approximately in the proportion of 905 to 884). But the change-over is of interest. In the age group 5–15 Germany also has some advantage for the years considered.

In Table III the rates for the principal groups of causes in England and Wales are given as percentages of the contemporary German rates. It will be seen that the English disadvantage in the age group 1–4 inclusive is greatest in the group of infectious diseases and in diseases of the respiratory system. Analysis of the former shows the principal contributors to be measles and whooping-cough.

I am of course aware that it would be dangerous to draw firm conclusions from a comparison restricted to a short series of years in which, as I have said, epidemic diseases have been a main factor of the difference. But the results suggest some reflections. English writers, notably Halliday (Medical Research Council Special Report Series, No. 120), have called attention to the importance of the housing factor in determining the rate of mortality from measles, and the Chief Medical Officer of the Ministry of Health has discussed the problem of the pre-school child. Although, as he noted, the English rate of mortality at this age has improved enormously during the last thirty years, it seems possible that the conditions are capable of further improvement, and that a comparison of administrative systems might be instructive.

RELATION OF VITAMIN D AND MINERAL DEFICIENCIES TO DENTAL CARIES

BY

GEOFFREY F. TAYLOR, M.R.C.P.

Professor of Clinical Medicine, King Edward Medical College, Lahore

AND

C. D. MARSHALL DAY

Dean, Faculty of Dentistry, Punjab University

In view of the Medical Research Council's recent investigations into vitamin D deficiencies in dental caries the results of the examination of the teeth in ten cases of severe clinical rickets, with radiological confirmation, are reported from an examination of children in the Kangra District of the Punjab, Northern India.

A diet and health survey of this district recently carried out by the Public Health Department and by Dr. D. Curjel Wilson has shown a high incidence of rickets and osteomalacia and definite vitamin D, calcium, and phosphorus deficiencies in the diet of most of the population there. Fifty children with rickets were collected by Miss Edgar of the Canadian Mission Hospital at Palampur and examined clinically and dentally by both of us. A very low incidence of dental caries and hypoplasia was noted. A number of these children were conveyed by car to a neighbouring hospital thirty miles away for radiological examination, and the following results were obtained.

Results of the Investigation

Case 1.—A female child aged 4. Severe clinical rickets. Bowed legs, enlarged epiphyses, head bossing. Skiagram: advanced rickets; irregular enlarged epiphyses; cupping; decalcification. Teeth: twenty deciduous present; number of cavities, two, in E|E ; arches well formed, no irregularities; hypoplasia (gross naked-eye), *nil*.

Case 2.—A female child aged 11. Severe clinical rickets. Enlarged epiphyses, curved legs, ribs "rosary." Skiagram: advanced rickets; irregular badly ossified enlarged epiphyses;

decalcification; green-stick fracture of ulnar shaft. Teeth: ten deciduous and seventeen permanent present; number of cavities, four (defective fissures only), in $\frac{6|6}{6|6}$; arches well formed, no irregularities; hypoplasia, *nil*.

Case 3.—A female child aged 11. Severe clinical rickets. Enlarged epiphyses, severe curvature of legs, ribs "rosary." Skiagram: advanced rickets; irregular epiphyseal line; cupping of epiphyses; decalcification. Teeth: seven deciduous and nine permanent present; number of cavities, *nil*; arches well formed, minor irregularity (angles Class I); hypoplasia, *nil*.

Case 4.—A female child aged 9. Severe clinical rickets. Curved tibia, knock-knees, epiphyses enlarged, ribs "rosary." Skiagram: irregular epiphyseal line; cupping of epiphyses; decalcification. Teeth: twelve deciduous and nine permanent present; number of cavities, *nil*; arches well formed and no irregularities; hypoplasia—pitting of deciduous teeth, slight opacity of enamel of permanent teeth.

Case 5.—A female child aged 8. Moderately severe rickets. Epiphyses enlarged. Skiagram: irregularity of epiphyses; decalcification. Teeth: eleven deciduous and twelve permanent present; number of cavities, one (defective fissure only) in $\underline{|6}$; arches well formed; slight crowding, $\underline{\lceil 3}$ in buccal occlusion; hypoplasia—pitting of deciduous teeth only.

Case 6.—A female child aged 10. Moderately severe rickets. Epiphyses enlarged. Skiagram: irregularity of epiphyses, which are "cupped"; decalcification. Teeth: ten deciduous and twelve permanent present; number of cavities *nil*; arches well formed, no irregularities; hypoplasia, *nil*; chronic suppurative periodontitis.

Case 7.—A female child aged 11. Severe rickets. Severe knock-knees, enlarged epiphyses, "rosary," and head bossing. Skiagram: irregularity of epiphyses, which are cupped; epiphyses enlarged; decalcification. Teeth: twenty-eight permanent present; number of cavities, one (defective fissure only), in $\underline{\lceil 6}$; arches well formed, no irregularities; hypoplasia—slight opacity of enamel, no pitting; chronic suppurative periodontitis.

Case 8.—A male child aged 13. Severe rickets. Bow legs, epiphyses enlarged, "rosary." Skiagram: irregular epiphyses; decalcification. Teeth: twenty-eight permanent present; number of cavities, two (buccal pits only), in $\underline{6|6}$; arches well formed, no irregularities; hypoplasia, *nil*.

Case 9.—A female child aged 8. Moderately severe rickets. Bow legs, enlarged epiphyses, "rosary." Skiagram: irregular epiphyses; decalcification. Teeth: sixteen deciduous and eight permanent present; number of cavities, *nil*; arches well formed, no irregularities; hypoplasia, *nil*.

Case 10.—A female child aged 12. Very severe rickets. Legs—severe curvature, epiphyses enlarged. Skiagram: very irregular epiphyses, cupping very marked; severe decalcification. Teeth: ten deciduous and twelve permanent present; number of cavities, four (defective fissures only), in $\frac{6|6}{6|6}$; arches well formed, no irregularities; hypoplasia, *nil*.

The results of these examinations are summarized in the following table.

Thus in ten cases of rickets, radiologically confirmed, there were four children whose teeth had no caries, and in the six other children a total of fourteen cavities were found, an incidence of 1.4 cavities per head in ten children. There were in the group ninety-six temporary teeth and 135 permanent teeth. Two cavities were found in the ninety-six temporary teeth, and twelve cavities in 135 permanent teeth, a total incidence of fourteen cavities in 231 teeth. Macroscopic hypoplasia was noted in only three of the cases.

These children came from a hill district and live in primitive conditions. The preliminary report of the diet survey of the district states that "the diet consists mainly of carbohydrates with relatively small proportions of protein and fat. Meat and fruits are almost entirely absent from the diet. Very small quantities of milk and vegetables are consumed." Sugar is rarely eaten. Two meals only are eaten daily, of rice and "chapatti" made from unmilled wheat, ground to flour in each home. Rickets and osteomalacia are very common in the population. The cases reported above are examples of "late rickets." It is proposed to investigate a group of osteomalacia cases for dental caries at a later date.

From the investigation we conclude that vitamin D deficiency alone does not cause either dental caries or hypoplasia of the teeth. We were impressed by the excellent formation of both teeth and jaws of this group of children. This low incidence of caries with excellent teeth and jaw formation is characteristic of the peasant of the Punjab, so far as our knowledge goes. We have not seen, in England, America, or elsewhere, such well-formed jaws and teeth with this low incidence of caries.

Comparison with Other Groups Examined

It is of interest to note, in another investigation made by one of us (C. D. M. D.) in the city of Lahore on a group of 800 school children of the Indian "middle class," having a diet more in keeping with European standards, including soft refined carbohydrates and sugar, eaten three or four times daily, that the incidence of caries was very much higher than in the rickets cases reported in this paper. An average of six cavities per child was noted in the group of 800 children.

In another group of twenty-six poor Indian children of an Indian orphanage in Lahore, examined clinically and dentally by both of us and eating a low diet resembling that of the Kangra children reported above, the incidence of caries was 2.27 cavities per mouth. Eight of the twenty-six children had no caries. The average haemoglobin content of the group was only 63 per cent. The anaemia

Case No.	Age	Clinical Rickets	Skiagram	Teeth Present		Cavities		Hypoplasia
				Temporary	Permanent	Temporary Teeth	Permanent Teeth	
1	4	++	++	20	—	2	—	—
2	11	++	++	10	17	—	4 (defective fissures only)	—
3	11	++	++	7	9	—	—	—
4	9	++	+	12	9	—	—	Present in temporary and permanent teeth
5	8	+	+	11	12	—	1	Present in temporary teeth
6	10	+	+	10	12	—	—	—
7	11	++	++	—	28	—	1	Present in permanent teeth
8	13	+	+	—	28	—	2	—
9	8	+	+	16	8	—	—	—
10	12	+++	+++	10	12	—	4 (defective fissures only)	—
	Totals			96	135	2	12	

was of the hypochromic iron-deficiency type. Ferri et ammon. citras in large doses was given to all the children of the orphanage, with the result that the haemoglobin rose to an average of 92 per cent. within one month, the diet being unaltered during this period.

Further, in the fifty Kangra children examined two showed severe hypoplasia and dental caries, the mouth condition resembling that seen commonly in Europe and America. The clinical notes are as follows:

A female child aged 4 years. History of discharging ear since birth, the discharge being still present. Cod-liver oil had been given since birth, as the child lived in the hospital compound. There were no clinical signs of rickets. Skiagrams of epiphyses were normal. Teeth: twenty deciduous present; number of cavities, fourteen, in $\frac{EDCBA \mid ABCDE}{ED \mid DE}$; arches well formed, no irregularities; severe hypoplasia.

A male child aged 5. History of pneumonia in infancy followed by frequent chest colds. Slight bowed legs and enlarged epiphyses. Skiagram: irregular epiphyseal line; cupping; decalcification—that is, clinical and radiological rickets. Teeth: twenty deciduous and two permanent present. Number of cavities, ten, in $\frac{EDCBA \mid AB}{ED \mid D}$; anterior teeth worn to gum line, showing definite arrested caries; arches well formed, no irregularities; severe hypoplasia.

It is significant that these two children (who had had respectively severe sepsis and pneumonia from birth) were the only two cases with severe hypoplasia and dental caries.

Conclusions

These investigations show that almost perfect teeth with a very low incidence of dental caries and little gross hypoplasia are found in a group of children with severe clinical rickets, radiologically confirmed, in the Kangra District of the Punjab.

The diet of the children is definitely deficient in minerals and vitamin D, and in view of the recent survey by the Public Health Department in this district and the widespread incidence of osteomalacia and rickets there is good reason to believe that the maternal diet also was deficient in calcifying properties during pregnancy and lactation.

From the investigation it is seen that diets deficient in calcium and phosphorus and the fat-soluble vitamins and rich in "anti-calcifying" cereals do not lead to a greater susceptibility to dental caries under the conditions reported.

The very low caries incidence in the Kangra District and in the orphanages investigated in Lahore, together with the physical nature of the food eaten, lends support to the "detergent diet" theory of Sim Wallace, which postulates that the physical nature and cleansing action of the diet is of more importance than other factors in the prevention of dental caries.

Furthermore, sepsis and the exanthemata of childhood would seem to be more potent factors in the causation of hypoplasia and caries than vitamin D and mineral deficiencies.

It is proposed to publish a detailed report of the investigation of Lahore school children at a later date.

The first award of the Treacher Collins Prize, value £100, has been made by the Ophthalmological Society of the United Kingdom to Dr. T. Hewitson Brown (Edinburgh) for an essay on "Cerebrospinal Disease and its Relation to the Optic Nerve." Essays by Dr. S. Nevin (King's College Hospital) and Dr. N. S. Alcock (British Postgraduate Medical School) were warmly commended.

Clinical Memoranda

Misguided Efforts at Abortion

The following cases were met with in the gynaecological ward of St. James's L.C.C. Hospital during the past two years.

FOREIGN BODY IN BLADDER

Case 1.—A 4-para, aged 26, eight weeks pregnant, was admitted with a history of having attempted three days before to pass a piece of elm bark into the uterus. The instrument disappeared, and symptoms of pain on micturition and haematuria followed. Examination of the urine showed blood, but the culture was sterile. Under general anaesthesia the urethra was dilated by Hegar's dilators so that it admitted a little finger. The stick was manipulated by a finger in the bladder and pressure of the other hand suprapubically so that it lay with one end at the internal urethral orifice. A sponge forceps was then passed to what was considered the requisite level and the end of the stick seized and pulled forth. The operation caused moderate laceration of the urethra. Urinary antiseptics and irrigation with oxycyanide of mercury, 1 in 10,000, were employed, and a self-retaining catheter was inserted for two days. The patient went home one week after operation with complete control of micturition and no urinary symptoms.

Case 2.—A 2-para, aged 28, eight weeks pregnant. There was no sign of any injury to the external meatus. A piece of elm bark had been in for several days, and the bladder was in a condition of acute cystitis. The bark, measuring 6 inches by ½ inch, was removed in the same way as above.

Case 3.—A primipara, aged 31, five months earlier had thought herself pregnant, and to procure miscarriage had passed a piece of elm bark accidentally into the bladder, and there it remained. She was rewarded by the regular reappearance of the menses, but dysuria and haematuria persisted. Actually she became pregnant about three months after introduction of the elm bark. On sounding the bladder it was possible to make contact with a hard object. The operation described above was carried out, but with much laceration of the urethral mucosa; for the bark, measuring 2¼ inches by ½ inch, was entirely encrusted with phosphatic deposit. In spite of this the patient was able to micturate with little discomfort after two days. Irrigations were continued for a week, and the patient was discharged.

These cases show the tolerance of the bladder for comparatively large pieces of wood, the distensibility of the female urethra, and the rapid return of sphincteric control. The transurethral route was chosen as being less likely to promote miscarriage than suprapubic cystotomy. All three patients were readmitted at term and delivered normally of healthy children. There was no recurrence of urinary symptoms during pregnancy, labour, or puerperium.

INJURY TO RECTUM

The fourth case is one of injury to the rectum.

Case 4.—The patient, aged 24, had missed a period for two weeks, and for one week she had been constipated. A Higginson's syringe has been used per vaginam and the nozzle had met and perforated the rectal and vaginal walls, which were bulged forward by hard faeces. The patient expected pain and blood, and she got them. The injection caused the bowels to move, and on admission faeces were being passed freely per vaginam. The speculum showed a grey, ragged slough occupying most of the upper half of the posterior vaginal wall, and at the centre of this area was a fistula through which rectal mucosa could be seen. The uterus was bulky, but pregnancy was not diagnosable till later. The fistula was treated by rectal and vaginal douches of dettol twice daily, and in two weeks the wound was healthy and

of the size of a half-crown. One week later, under general anaesthesia, it was closed by a row of interrupted catgut sutures. This led to complete healing of the wound. The patient was seen ante-natally on nine occasions, and readmitted for Caesarean section before the onset of labour. We felt that if vaginal delivery had occurred the recent soft scar of the fistula would have given way when stretched by the foetal head, and that the puerperium would have become complicated as a result of the open cervix practically projecting into the rectum. The child was alive and healthy and the puerperium normal. Three weeks after delivery the scar in the vagina was seen to be well healed and the patient was devoid of symptoms.

All these four patients were well pleased with their babies, although they had incurred such grave risks to end their pregnancies in the beginning.

Our thanks are due to Sir Frederick Menzies, Medical Officer of Health for the County of London, for permission to publish these cases.

R. L. DODDS, M.B., M.Ch., F.R.C.S., M.R.C.O.G.
M. H. MAYEUR, M.D., F.R.C.S., M.R.C.O.G.

Bilateral Torsion of the Ovary

This fortunately uncommon condition occurred in a young unmarried lady aged only 20. There was an interval of two years between the attacks, but on each occasion the ovary had to be sacrificed. The pathological condition present was on each side a pseudo-mucinous multilocular cystadenoma complicated by torsion, and giving rise to a large amount of free fluid in the peritoneal cavity.

CASE HISTORY

The patient was admitted to the Bute Hospital, Luton, in August, 1938, complaining of pain in the upper abdomen for twelve hours. The pain had a sudden onset and had varied in intensity. She had not vomited, and the bowels had been open that morning. Periods had been regular, the last being two weeks previously. Examination showed a healthy-looking girl; temperature 99°, pulse 96, respirations 18. The only abnormal finding was slight tenderness in the right iliac fossa. The abdomen was rather full and doughy, but not rigid. Rectal examination was negative. Conservative treatment was carried out until the evening of the third day, when there was a sudden increase of pain with a rise of the pulse rate to 100. On examination there was tenderness and rigidity in the right iliac fossa. Operation the same evening showed the peritoneum filled with many pints of free fluid. The right ovary was twisted tightly on its pedicle and had to be removed. The ovary on section contained much blood but no evidence of normal ovarian tissue. The patient made a normal recovery.

Past History.—In April, 1936, abdominal pain caused her to seek advice at the Royal Free Hospital. A diagnosis of ? fibroid reaching to the umbilicus was made. In the following July she was admitted to the hospital with severe abdominal pain, which had been present for four days. She also had a sore throat and headache, and had vomited. Her temperature was 100° and pulse 108, and she had acute follicular tonsillitis. There was a tense mass in the abdomen extending to the umbilicus, and marked ascites. Vaginal and rectal examination was negative. At operation there was torsion of a large ovarian cyst of the left ovary. This was removed. Section of the specimen showed a pseudo-mucinous cystadenoma. The patient made a good recovery.

I am indebted to Dr. Vickers for permission to publish this case, and to Miss Aileen Cobbe, who kindly supplied me with full notes of the patient's stay in the Royal Free Hospital.

London, S.W.2. W. D. PARK, M.B., B.S.

Reviews

MEDICINE: A YEAR'S REVIEW

The Medical Annual, 1939. Edited by H. Letheby Tidy, M.A., M.D., F.R.C.P., and A. Rendle Short, M.D., B.S., B.Sc., F.R.C.S. (Pp. 660; 72 plates, plain and coloured, and 124 illustrations. 20s. net.) Bristol: John Wright and Sons; London: Simpkin Marshall. 1939.

In this year's *Medical Annual* the editors, after referring to the success attending modern drug therapy and the need for the medical man to keep himself up to date, end their introduction with these words: "It is not good enough to try to read, still less to believe, all the innumerable trade advertisements that fill his letter box (and, it is hoped, his waste-paper basket) when competent guidance is available for those who have no financial interests in the treatments they praise or reject." The word "propaganda" now covers everything from the simple hoodwink to the unvarnished lie. In what should have been the age of leisurely thought the modern doctor, like everyone else, has too little time to "stand and stare"; often he has to read as he runs, and so opens his mind to the propaganda material of the firm that is after his custom. The temptation to take short cuts to knowledge is hard to resist, but the short cut may, after all, turn out to be the longest way round. The decision, then, having been firmly taken to make free use of the waste-paper basket, the next step is to buy the *Medical Annual*, for here is the combined wisdom of a team of experts, a critical survey of the most recently ploughed fields in the country of medicine.

Much attention is, of course, given to chemotherapy and the sex hormones. A helpful article on clinical pathology tells the practitioner how to make full use of the pathologist's services. Maternity and child welfare, legal decisions and enactments of medical interest, venereal diseases, are also dealt with at length and in an interesting way. We welcome the article on the sedimentation rate and hope that, now "it has become possible to estimate its value" after twenty years, medical literature may be relieved of the burden of unnecessary articles it has had to carry on this subject. As the editors remark: "Numbers of persons who have been compelled to produce some sort of *Arbeit* have turned to the sedimentation rate. . . ." Sympathetic nerves have been cut for a number of conditions, and the conservative-minded at times have wondered whether the surgeons have not discovered another "nuciform sac." The editors sum up the present position in these words: "A special review is included of the indications for sympathectomy. It is very good for hyperidrosis."

The illustrations, including a number of coloured plates, are of the customary excellence, and editors and publishers alike are once again to be congratulated on the high standard of their invaluable publication.

PSYCHOPATHIC PERSONALITIES

Psychopathic States. By D. K. Henderson, M.D. (Pp. 178; 8s. 6d. net.) London: Chapman and Hall. 1939.

Professor Henderson's discussion of the psychopathic states is a notable addition to the valuable contributions to psychiatry which have been made under the aegis of the annual Salmon lectures. He discusses the general classification of mental illness, and remarks that when all the cases in a collection of psychically deranged persons have been so far as possible duly pigeon-holed under

the conventional diagnoses usually adopted, we have left quite a large amorphous group which it is difficult to allocate convincingly. These persons cannot as a rule be dealt with in an institution, since they do not come within the definition of any Act of Parliament.

Case notes illustrate the clinical manifestations, which are described under the three main headings of predominantly aggressive, predominantly passive or inadequate, and predominantly creative. In the first group are certain suicides, especially those in whom the suicide or attempted suicide takes the form of sudden impulses out of the blue, of aggression against the self. Certain cases of murder and assault are of the same nature, the impulse being apparently unrelated to previous behaviour or even to previous mental content. Alcoholism and drug addiction, epileptoids, and sex variants are included in this group. In the second group are many so-called psychoneurotics, and also those of a cycloid and schizoid tendency who are not definite enough in their symptomatology to be classified as cyclothymics or schizophrenics. In the third group are certain "queer geniuses."

The author criticizes the somewhat facile optimism of many psychotherapists, and submits that all experienced workers must admit that quite a number of their patients do not respond to treatment as they would wish. While this is no doubt scientifically true we do not want to damp the optimistic ardour of the psychotherapist and revert to the pessimism and *laissez-faire* attitude in respect to treatment which was all too common a generation ago. As to treatment itself, the author advocates an eclectic attitude and avoidance of dogmatic entanglements, while he insists on the value of the psychobiological approach of Adolf Meyer, by which every aspect of heredity, upbringing, and environment is considered in relation to the personality under review. He quotes several cases in which after a bad start psychopathic persons have made a good adjustment to life, whether as a result of careful and prolonged treatment or by reason of a spontaneous adaptation, and so he claims that an unduly pessimistic attitude should not be taken up. At the same time these people are a very serious social problem, which can only be solved by prolonged and careful study which may result in the demand for some sort of colonization under supervision, at least for a time, of these community misfits.

Certainly this is a book which everyone concerned with medicine, sociology, and delinquency ought to read. The study is well written, clearly expressed, and, above all, brief.

HISTORY OF TUBERCULOSIS

A Historical Chronology of Tuberculosis. By Richard M. Burke, M.D. (Pp. 84; 1.50 dollars, post free.) Baltimore, Maryland, and Springfield, Illinois: Charles C. Thomas. 1938.

In the introduction to this little book Dr. Burke describes it as "an attempt to convey very briefly the story of tuberculosis." Actually a "story" presented in chronological form is apt to be wearisome reading, but this should prove a valuable and handy book of reference for the student of tuberculosis. The history of the disease is divided into three periods. In the ancient period (5000 B.C. to A.D. 1600) the contributions made to the subject were mostly limited to descriptions of the symptoms of phthisis. In the second or pre-modern period (1600–1800) necropsy observations were added, and the tubercle was recognized as the precursor of phthisis and scrofula. The third or modern period is divided into two parts. The first part (1800–81) includes the establishment of the "unity" of tuberculosis and appreciation of its protean manifestations, the study of the cellular structure of the tubercle, and Villemin's experiments which demonstrated that tuberculosis was a specific inoculable disease. The second part of the modern period began with Koch's fundamental discovery, followed by the introduction of radiology in diagnosis and the development of modern sanatorium and collapse therapy. At the beginning of each of these four sections Dr. Burke adds pertinent discoveries in general medicine, on the ground that our knowledge of tuberculosis closely followed the path of general medical progress, and he includes certain happenings in world history which "formed part of the background upon which the complex pattern of tuberculosis has unfolded." We do not suppose the author himself would wish to claim that the book is comprehensive; nevertheless one omission at all events should not have occurred: there is no mention of Marcus Paterson and his auto-inoculation theory, which certainly in this country had a profound influence on "sanatorium treatment." Again, though the dates of the first appearance of the *Beiträge zur Klinik der Tuberkulose* (1903), the *Zeitschrift für Tuberkulose* (1906), the *American Review of Tuberculosis* (1917), and the *Acta Tuberculosea Scandinavica* (1925) are given, neither *Tubercle* nor the *British Journal of Tuberculosis* is mentioned. It is of interest to note that by 1927 there were already thirty-three medical journals devoted exclusively to tuberculosis. Finally it should be pointed out that certain events in England are described in a slipshod fashion, which in one instance will give the uninformed reader a completely erroneous impression. Thus in 1925, we are told, a "British law requires compulsory segregating of infectious 'TBs.'" Why the expression "TBs" (*sic*) is used (as in "1921 Public Health Law (England) requires 'TB' Scheme to be formed in every county and borough") is difficult to understand, but the whole statement is only part of the truth. Section 62 of the Public Health Act of 1925 merely "provided" for compulsory segregation under certain circumstances, and even as recently as 1932 MacNalty stated that in practice local authorities had seldom taken action under this Act.

OBSTETRICS AND GYNAECOLOGY IN 1938

The 1938 Year Book of Obstetrics and Gynecology. Obstetrics edited by Joseph B. DeLee, A.M. Gynecology edited by J. P. Greenhill, B.S., M.D., F.A.C.S. (Pp. 672; 139 figures. 2.50 dollars; 10s. 6d., postage 6d.) Chicago: Year Book Publishers; London: H. K. Lewis. 1939.

Those readers who are familiar with previous editions of this excellent little book will by this time have bought the new edition, for the "Year Book habit" is easily formed but fortunately not easily broken. The amount of interesting and useful information presented in such a readable form in so small a space is really amazing. Every senior medical student, practitioner, and consultant should possess a copy and keep it available for reference at the study or office desk. In these days of rapid advances in the fields of chemotherapy and endocrinology it is difficult to keep in touch with new work and new lines of treatment, but the *Year Book* provides a means of doing this. An excellent index system makes it easy to find information required, and references are given to the original extracts for those who wish to study a particular problem more deeply. Probably most important of all is the editorial comment to guide the reader—comment that is discriminating, concise, and generous in assessing both truth and error.

The illustrations this year are particularly fine, and special mention must be made of the photomicrographs,

which, with few exceptions, are excellent. Opinions on the most recently described ovarian neoplasms are admirably summarized and a guide given to the safest method of treatment. There are few problems in either obstetrics or gynaecology which do not receive some mention in the new edition, and it can be recommended most warmly to all who are interested in the theory and practice of this branch of medicine.

DERMATOLOGY IN 1938

The 1938 Year Book of Dermatology and Syphilology. Edited by Fred Wise, M.D., and Marion B. Sulzberger, M.D. (Pp. 718; 85 figures. 3 dollars; 12s. 6d., postage 6d.) Chicago: Year Book Publishers; London: H. K. Lewis. 1939.

The 1938 volume of these authors' well-known review of the year's progress in the above subjects has made its appearance. As usual they make a prominent feature of an introductory article on some branch of therapeutics, and this year they deal with the treatment of the deeper fungous infections of the skin, including ringworm of the scalp and bearded regions, and the comparatively rare fungous affections of the subcutaneous tissues. As a matter of fact this subject is not of great practical importance in the British Isles, especially in England, where the incidence of ringworm of the scalp has been reduced to quite a trivial number of cases per annum, and ringworm of the beard has become an actual rarity. No doubt the state of affairs is otherwise in the United States, where the standard of living, both among the large negro population and also to a lesser extent among the more recent immigrants from Central Europe, is such that these infections are much commoner; moreover, a considerable area of the U.S.A. boasts a subtropical climate in which parasitic fungi are far more active than in the temperate zones. The editors also devote considerable space to the very topical problems of allergy and immunology. An immense amount of work is being done on these throughout the world, but it cannot be said that any real progress has yet been made in elucidating the principles which govern either the inflammatory manifestations or their successful treatment. Drs. Wise and Sulzberger have evidently made a very thorough study of the periodical literature of their subject, and they have collected and abstracted most of the more interesting articles that have appeared during the year under review. They have also included most of the therapeutic advances made. In fact this volume is full of interest to all who are concerned with dermatology, and the practitioner will be able to gain many useful hints from its perusal.

MICROBIOLOGY FOR THE MILLION

Man Against Microbe. By Joseph W. Bigger, Sc.D., M.D., F.R.C.P.I., M.R.C.P. (Pp. 304; 17 figures; 18 plates, including a frontispiece. 7s. 6d. net.) London: English Universities Press. 1939.

The success of any attempt to popularize microbiology nowadays is likely to be measured by comparison with several books of this kind which have lately appeared in America. If Professor Joseph W. Bigger's *Man Against Microbe* has not quite the popular appeal of one or two of its predecessors it will be because anxiety to do his subject justice has impelled him to translate the whole of it into the language of the layman, rather than to deal with only some aspects of it which are likely to awaken general interest. His book divides itself into three main parts, of which the historical section owes much, as he freely acknowledges, to Clifford Dobell's *Antony von Leeuwenhoek and his Little Animals,* and to the writings of Professor Bulloch. A second part is devoted to the fundamental facts of the subject, the general properties of micro-organisms, the methods by which they are studied, and a fairly detailed exposition of immunity; this section should ensure that later references to its subject-matter can be understood, but technical terms are used freely, and the glossary at the end is perhaps a wise precaution. Thirdly, applied medical microbiology is dealt with mainly in five concluding chapters in which disease is classified according to its mode of transmission; the titles of these chapters are almost the only concession to sensationalism in the whole book. Within the limits imposed by this wide scope and serious purpose, the subject-matter is full of interest and the writing often picturesque; the carrier state, for example, is aptly described as the result of "a sort of non-aggression pact between the microbe and the body." Personalities live and anecdotes abound, while the reader is taken all over the world in accounts of great epidemics and of pioneer work in disease prevention. The layman who wants the truth, the whole truth, and nothing but the truth about microbes can do no better than read this book.

Notes on Books

In *Recollections of Student Life and Later Days* (London: H. K. Lewis, 1s.) Mr. C. J. BOND has paid an affectionate tribute to his lifelong friend Sir Victor Horsley. These reminiscences go back to University College, London, in 1875, and recall fellow students afterwards distinguished but now fading into the mist of history. There must still be many members of the profession who will be interested to read Mr. Bond's memories of a great scientific surgeon who was for a long time a dominant figure in the central affairs of the British Medical Association.

Miss WINIFRED DUKE tells the story of the Crumbles murder, 1920, clearly and directly in the introduction to *Trial of Field and Gray,* volume 67 of Notable British Trials (London: William Hodge, 10s. 6d. net). The rest of the volume consists of a table of leading dates and times, the verbatim report of the trial and the appeal, and the various statements made by the two accused. There is a folder plan of the Crumbles near Eastbourne, but it is rather a work of supererogation, as nothing turns on the information it gives. There is a photograph of a public-house outside which a bus conductor had a conversation with the two accused and their victim Irene Munro; it is a respectable-looking public-house, but the picture is quite unnecessary. There are some photographs of Mr. Justice Avory and counsel in the case. The crime was an impromptu, purposeless, and sordid murder; and the scoundrels who committed it were spiritless and uninteresting, except perhaps for the variety of their clumsy lies. It is hard to see why this trial was chosen for this usually excellent series.

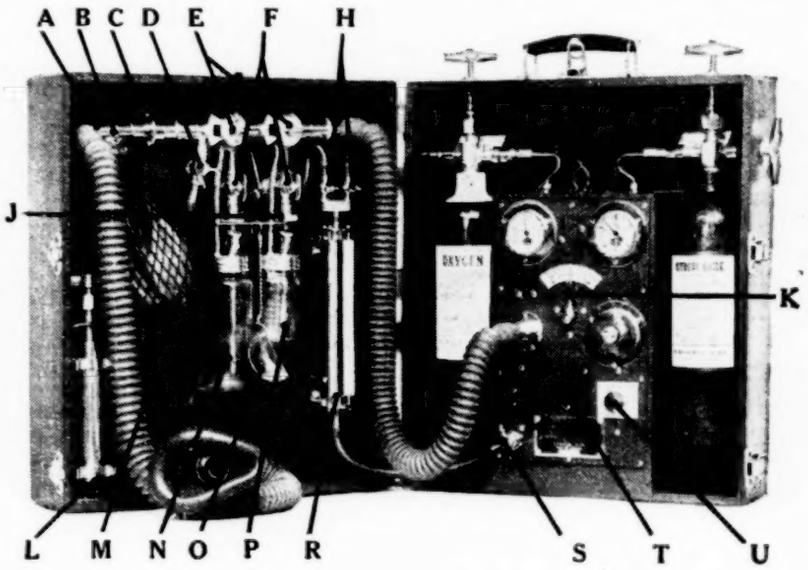
The short volume *Alcohol: Its Action on the Human Organism* was originally compiled in 1918 by the Central Control Board, and was a very valuable authoritative statement regarding this controversial subject. A second edition was produced in 1924 by a committee set up by the Medical Research Council, and a third edition has now appeared. It is of interest to note that the members of the committee responsible for the present edition were all concerned with the production of the original work twenty years ago. The general form and scope of the book have not been altered, but it has been revised to bring the subject-matter up to date. Here in small compass is a clear and accurate account of the physiological and psychological effects produced by alcohol. It is published by H.M. Stationery Office at 1s. net.

Preparations and Appliances

PORTABLE ANAESTHETIC APPARATUS

Dr. E. B. RAYNER (London, S.W.19) writes:

The foundation upon which the portable anaesthetic apparatus to be described has been built is the British Oxygen Co. Model G gas–air—gas–oxygen analgesia apparatus previously described in the *Journal* by L. C. Rivett (1936, **2**, 1263). In this (G-type) apparatus gas pressure reduction takes place in two stages: *First Stage*—continuous flow; reduction to 5 lb. per sq. in. *Second Stage*—intermittent flow; reduction to 1½ in. water column which can be increased up to a pressure of 25 mm. of mercury by a calibrated valve (U). The proportion of nitrous oxide to oxygen is controlled by a calibrated valve (K) on the face of the G model.



A deep lid replaces the normal shallow lid of the apparatus and in it is mounted the ether – chloroform circuit, consisting of: (1) flowmeter (R); (2) chloroform bottle (P); (3) filling funnel (O); (4) ether bottle (N); (5) carbon dioxide (sparklet type) resuscitator (L); (6) non-return valve (C); and (7) rebreathing bag (M). A "tapping," from the first stage of reduction, controlled by a valve (S), provides a continuous flow of gas and/or oxygen through the flowmeter, which can be diverted, if desired, by means of taps H and F through chloroform and/or ether bottles, and thence by the rebreathing bag to the patient. The rebreathing bag can be cut out of the circuit if necessary by the valve B. When continuous flow anaesthesia is being used the intermittent-flow stage is automatically short-circuited. For intermittent-flow anaesthesia valve S is closed, the standard outlet (T) to the (G type) set is utilized, and the rebreathing bag must be in circuit. The pressure at which the gases flow can be adjusted by means of a calibrated valve (U) at pressures varying from 0 to 25 mm. of mercury. The gases can also be deflected through chloroform and/or ether by taps E and F. In both continuous and intermittent-flow anaesthesia the level at which the gas is passed through or over the ether and/or chloroform is regulated by passing it through a rotatable sleeve valve controlled by "knurled" screws (J) calibrated for five settings.

The set is also supplied with a carbon-dioxide sparklet type resuscitator fitted in a quick-release bracket, and connected to the circuit at nipple D, which is supplied with a tap. The resuscitator can thus either (*a*) be used with the anaesthetic apparatus, or (*b*) be instantly detached for the resuscitation of an infant without interfering with the integrity of the anaesthetic circuit. To minimize the risk of leakage non-return valve C has been fitted between the rebreathing bag and the ether bottle. This valve is supplementary to that incorporated in the standard G-type apparatus. Finally, the face-piece is fitted with a McKesson expiratory valve, in addition to the ordinary expiratory valve, which can be closed when intermittent anaesthesia is in progress. The face-piece is connected by a length of unkinkable rubber tubing to a metal union, which can be plugged into the set at either the terminal end of the circuit (A) or at the standard outlet (T) of the (G type) set. The normal functioning of the analgesia apparatus has not been interfered with in any way.

With this apparatus gas–air or gas–oxygen analgesia of controllable depth can be self-administered; continuous or intermittent gas–oxygen anaesthesia with or without ether and/or chloroform can be given; and resuscitation of the asphyxiated can be attempted. The dimensions of the apparatus (closed) are as follows: height, 19 in.; width, 17½ in.; and depth, 8 in.; with cylinders holding 100 gallons of nitrous oxide and 30 gallons of oxygen its weight is 49 lb.; without the cylinders it weighs 30 lb. It has been calculated that about 80 gallons of nitrous oxide will maintain anaesthesia throughout a major operation, but should a renewal become necessary this can be carried out so easily and rapidly in this apparatus that the even tenor of anaesthesia is not disturbed. Provision can, however, be made for an additional cylinder of each gas if desired.

I am deeply indebted to Messrs. Durand and Lingwood of the technical staff of the British Oxygen Co., Ltd., for their enthusiastic and ingenious co-operation, and to the British Oxygen Co., Ltd., for the generous way in which it has carried out the experimental work involved.

BABY FOODS WITH VEGETABLES

"Veguva" No. 1, said to be suitable for infants up to three months of age, is a dried milk powder with additions of carbohydrate, soluble protein, egg yolk, yeast, carrot, and tomato juice. The percentage composition is given as protein 16, fat 15, and carbohydrate 65, and caloric value 23 per heaped teaspoonful. Diluted according to instructions for the month-old infant (three heaped teaspoonfuls to 3½ ounces of water) the milk mixture would have the approximate percentage composition: protein 1.8, fat 1.7, carbohydrate 7, a mixture which does not appear to be well balanced, being very low in fat, high in carbohydrate, and on the low side for protein of so poor a biological value as that of cow's milk as compared with human milk. It is doubtful whether all the additions mentioned will adequately compensate for a mixture of this type. Moreover the final product looks grey, and has not an agreeable taste. "Veguva" No. 2 is a vegetable mixture (with a basis of spinach, carrot, and tomato) with the addition of carbohydrates, egg yolk, yeast, banana, flour, and a small quantity of glycerophosphate. It has a caloric value of 30 per heaped teaspoonful, and is intended for addition to a milk-and-water mixture from the fourth month onwards.

There is much to be said for this early addition of vegetables in the artificial feeding of infants, and if these "Veguva" products retain the vitamins and minerals of the vegetables employed they should be found useful in infant feeding. They are supplied by A. Wander Ltd., 184, Queen's Gate, S.W.7.

Nova et Vetera

AN ELIZABETHAN TEXTBOOK OF MIDWIFERY

One or two rare and intrinsically interesting old medical books have recently passed through London sale-rooms. One is a copy of R. Banister's *Treatise of One Hundred and Thirteene Diseases of the Eyes and Eyeliddes*, the second edition, published by Felix Kyngton for Thomas Man in 1622. The author describes himself as an oculist and a physician. No copy of the first edition exists, so far as is known; and this later imprint is exceedingly scarce. Three of John Hunter's works have also been sold: a *Practical Treatise on Diseases of the Teeth*, first edition, 1778; a *Treatise on the Venereal Disease*, first edition, 1786; and *Observations on Certain Parts of the Animal Œconomy*, first edition, 1786.

Of greater interest than any of the above is Eucharius Roesslin's textbook of midwifery, supposed to be the first to be published in the English language. Little is known of Thomas Raynolde, the translator, except that he was a physician and later on published another medical work. His *Birth of Mankynde* was dedicated to Queen Catherine (Parr), sixth wife of Henry VIII. It appeared in 1540, and was printed by Thomas Raynolde—believed to be a relative, not the physician himself—in the parish of St. Andrew Wardrobe. Later editions came out in 1545, 1564, 1565, 1598, 1604, 1676—testimony to the esteem in which the book was held. The English is quite scholarly, and not so remote from modern usage as some of the less literate products of similar date are apt to be—in other words, Raynolde was evidently a man of education. The quotations that follow are from the edition of 1565, a copy of which has just passed through the saleroom.

"The birth of mankynde, otherwise named the womans booke. Newly set forth, corrected, and augmented. Whose contents ye may reade in the Table of the booke, and most playnely in the prologue, By Thomas Raynolde, Physition.

"In this first booke then shall be declared the fourme, maner, and situation of the inward partes of a woman, such as are in them by nature dedicate and assigned to the propagation, conception, and bearyng of mankynde. . . . Although that man be as the principall mover and cause of the generation: yet (no displeasure to men) the woman doth conferre and contribute much more, what to the encreasement of the chylde in her wombe, and what to the nouryshment thereof after the byrth than doth the man.

". . . the wombe do signifie . . . the place wherein the seede of man is conceaved, fetified, nourished, and augmented unto the tyme of deliveraunce . . . the necke of this wombe . . . we wyll call the wombe passage, or the privie passage . . . to make especiall mention of the length of this wombe passage were but follie, for the diversitie thereof."

There follows an account of the uterus, somewhat surprisingly describing "a certayne seame . . . in the inward vault, cavitie, or holonesse . . . dividing the wombe into two equall partes or sydes, the ryght and the lefte." He goes on to denounce as an error the belief which

"divers clarkes have written, and many other have beleaved, that there should be seven selles, or seven distinct places in the matrix, in three of the which on the ryght syde should onlye men chyldren be conceaved, and in the other three on the lefte syde women chyldren, and if it chaunced that the seede were conceived in the seventh sell, which was the myddlemoste, then that should become a monster, halfe a man and halfe a woman. The whych al is but lyes, dreames, and fonde fantasies."

He goes on to explain that the "wombe port," by which he means the cervix, is not dilated during sexual intercourse "excepte that it be at such tyme that the matrix being apt and disposed thereto, and other conditions requisite, this wombe port do naturallye open itself, attracting, drawing, and sucking into the wombe the seede, by a vehement and naturall desyre."

He then describes the ovaries, which he tells his readers are "much fassyoned after the shape of a great and brode almonde." Next he mentions the "seede bryngers" as being "two vaynes and two artires . . . to each one vayne and one artire," and notes their connexion with the vena cava and the aorta respectively. He credits the arteries with the function of sucking in "fresh ayre, to temper the heate of the body withall," and of expelling "mistie fumes, and hoate breathes, or unnaturall vapours." He goes on to note that "some women in tyme of their travayle, moved through great payne and intollerable anguishe, forswear and vowe themselfe never to companye with a man agayne, yet after that the panges be past within short whyle, for entyre love to theyr husbandes . . . they forget both the sorow passed, and that whych is to come."

The second book is devoted to the management of labour, with a chapter on "remedies and medicines by the whiche the labour may be made tollerable, easie and without great paine." The drugs advised, mainly in the form of ointments or perfumes to smell, include myrrh, galbanum, castor, opoponax, hellebore, asafoetida, roses, maidenhair, cinnamon, savin, storax, saffron, cassia, etc. To bring on labour he recommends a plaster of wilde gowarde, myrrh, rue, and barley meal, to be laid on the lower abdomen.

The third book deals mainly with the care of the newborn child, with numerous remedies for its ailments. The fourth book contains an account of factors hindering conception or, on the contrary, furthering it. In the former category he places four general causes: too much heat of the matrix, too much coldness, too much humidity, and too much dryness. He notes the signs by which these constitutional conditions may be diagnosed, including in the third category too much fat and grossness, and in the fourth great thirst and emaciation with amenorrhoea (one may suppose he had diabetic cases in his mind). In cases of sterility he describes a method of diagnosing whether the male or the female partner is at fault, depending on the results of irrigating wheat and barley seeds with the urine of the respective parties; but he admits that the deductions drawn are frequently unreliable. Remedies for female sterility include bay leaves, mallows, red mint, myrtle, camomile, marjoram, marigold, sage, and mercury—all mixed together, boiled, and used as a bath; after which an electuary is to be swallowed containing spice, nutmeg, cloves, "galyngall," cinnamon, pepper, aniseed, sage, honey, and sugar. He concludes with remedies for superfluous hair, for freckles, dandruff, warts, and other blemishes.

On May 16 there will be sold at Sotheby's rooms a copy of the *Regimen Sanitatis* of Arnold of Villa Nova, published in Louvain in 1485. Also an extremely rare book by William Clowes, printed in 1585, entitled *A Briefe and necessarie Treatise, touching the cure of the disease called Morbus Gallicus, or Lues Venerea, by Unctions and other approoved waies of curing*; but one other copy is known to be in existence.

M. M. Drucker (*Thèse de Paris*, 1939, No. 2), who records twenty cases in patients aged from 28 to 65, states that cancer of the tonsil is more frequent in men than in women. Excessive smoking does not appear to be a predisposing cause, but is a factor in the extension of ulceration. Clinically the onset of the disease is usually not recognized. The symptoms are slight, and are not regarded as of any importance by the patient. Pain in the ear indicates that the tumour has reached a certain size and should not be regarded as an early sign. Drucker has obtained good results by transcutaneous radium therapy in lymphosarcoma of the tonsil, and three of his patients so treated survived for from two to six years. Operation by the buccal route appears to be indicated in epithelioma of the tonsil when the lateral and posterior walls of the pharynx are not invaded and the base of the tongue and floor of the mouth are not involved.

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AFRICAN MEDICINE

Quite recently the Colonial Office has made an important announcement. It is that a comprehensive nutritional survey is now being carried out in Nyasaland with the object of studying the actual and potential food resources of three contrasting areas. This survey is financed jointly by the Medical Research Council and the Colonial Development Fund, and is under the leadership of Dr. B. S. Platt. It is stated to be the first of its kind, and it aims at increasing existing knowledge of the relation between nutrition and ill-health, and suggesting means whereby improvements in nutrition may be effected. The real importance and significance of this announcement will be appreciated by those who have in mind the recently published *African Survey*, by Lord Hailey, one main practical conclusion of which was that an essential basis of policy in Africa must be scientific research. This, of course, is a novel idea to politicians and most administrators, but if applied in Africa it may eventually reach this country, where hitherto policy has almost always been founded not on science but on commercial interests. As an illustration, and in the sphere of nutrition, it may be noted that the supply of milk to school children was not initiated by the Board of Education or the Ministry of Health but by the Milk Marketing Board, which had difficulty in disposing of its "surplus" milk.

As a preliminary to this Nyasaland inquiry a volume supplementary to Lord Hailey's survey is very valuable and welcome. It is entitled *Science in Africa*, and is issued by the committee of the African Research Survey under the auspices of the Royal Institute of International Affairs.[1] It is a review of scientific research relating to Tropical and Southern Africa by Dr. E. B. Worthington, a Cambridge zoologist who is now director of the Freshwater Biological Association of the British Empire and who accompanied Lord Hailey on that part of his tour which covered French and British West Africa. The author naturally does not profess to write as an expert on most of the subjects he discusses, but the range of these subjects is astonishing, and certainly the three chapters dealing with health and medicine do not suffer from the fact that they are not directly and immediately the production of a medical man. Their comprehensiveness is remarkable. In the first of these chapters the various central organizations—international, in the parent countries, and in the Union of South Africa—which control or affect the health services of Africa south of the Sahara are described; and the local hospital and health arrangements in the several colonies—British, French, Belgian, and Portuguese—are passed in review. The education and methods of employment of Africans, either as fully qualified medical practitioners, as auxiliary doctors, or as medical aids, dispensers, or nurses, are set out, and the importance of developing the second of these classes is emphasized. It is noted incidentally that "the part played by the local Branches of the British Medical Association, especially in East Africa, is considerable," and that "the Association has inaugurated special research studies"; and with regard to the differences in method between French and British administrations it is said that "the latter system may be described as seeking to persuade the native to appreciate the high standards of European medicine: the former as lowering the standard to meet current native ideas." In the second of the chapters an admirable account, fully sufficient for the purposes of the book, is given of the prevalent forms of disease. They are divided significantly into (*a*) those which are primarily due to primitive conditions of life and which may be expected to disappear with improved social conditions and organization; (*b*) those which are primarily due to insanitary conditions and which may be expected to disappear with improved housing, water supply, etc.; (*c*) those the spread of which is largely due to ignorance (venereal diseases); and (*d*) those due to malnutrition, which may be expected to disappear with an improved standard of living. Many facts relating to these diseases are here assembled which cannot be found in such convenient arrangement elsewhere.

It is to questions of the physiology and development of Africans, particularly in relation to food and malnutrition and their associated medical aspects, that the third of the chapters is mainly devoted. It is of the greatest interest, importance, and value. No definite conclusions of wide application can as yet be stated on these subjects; but at the moment Africa is prolific of experiments on controlled diet of long duration, and opportunities of collecting the details and the results of these are rapidly disappearing as local food customs break down with the relaxing of tribal organization. Dr. Worthington, with exemplary completeness, gives references to the many tenta-

[1] *Science in Africa. A Review of Scientific Research relating to Tropical and Southern Africa.* By E. B. Worthington, M.A., Ph.D.Cantab. London: Oxford University Press. (10s. 6d.)

tive, local, and individual studies hitherto made in this field and to that of Drs. Gordon and Vint into brain size and intelligence of natives and Europeans in Kenya, and stresses the urgency of such organized investigations as the Colonial Office has now set on foot. Two or three points of some general importance in this connexion are brought out. It is even more clear here than elsewhere that the preventive and curative aspects of medicine are quite inseparable, and that preventive and curative functions cannot be distributed among a sectional personnel. It is certain, too, that though particular dietary deficiencies often produce specific diseases, "in actual fact the majority of specific deficiencies result in a general lowering of vitality and resistance to disease." Again, it may sometimes be difficult to determine whether some conditions are due to the toxic effects of some common article of diet or to the deficiency of other essential elements. This appears to be the case in regard to a condition involving blindness in a people in Nigeria who feed largely on cassava. Further, a customary native practice may yield dietetic information—for example, in Nigeria again, the leaves of the baobab tree, which have a high calcium content, are crushed and eaten in soups. Precautions are always taken to avoid direct sun on the leaves during the drying process, and laboratory experiment has shown that sun-drying as opposed to shade-drying destroys the vitamin content of the leaves. Dr. Worthington's survey has many chapters of much interest besides those dealing with health and medicine; but those to which we have drawn attention are not only of great value for reference but should provoke and aid further researches, of which the results cannot be foreseen.

THE STATISTICAL HISTORY OF APPENDICITIS

Although there are few now in practice who remember the time when the word "appendicitis" was unknown in medical circles (those who object to hybrids will be glad to learn that the word probably comes from America), those over 55 can recall times when it was not in general use. Dr. Matthew Young and Mr. W. T. Russell, in their recently published report,[1] suggest that it was the illness of King Edward VII in 1902 which interested the general public in the disease henceforth usually called appendicitis. At the present time appendicitis, although it is responsible for less than 1 per cent. of the total death rate, causes nearly two thousand annual deaths. The rate of mortality, which increased in the early years of this century, has not changed much in recent years; certainly it has not declined. It is common knowledge within the profession that the earlier a patient reaches the surgeon the better the prognosis, and, so long ago as 1887, Treves advocated removal of the quiescent appendix after a series of attacks attributable to inflammation. Then there has been, within and without the profession, debate on the aetiological factors; dietetic habits have been impugned. Rendle Short attributed the increasing incidence between 1895 and 1905 to a reduction in cellulose and fibre content of the diet and to an increased consumption of imported foods, especially meats. McCarrison in nine years' practice among the hill tribes of North-West India never had a case of appendicitis. The subject is therefore important enough to justify a historical-statistical study, which Dr. Young and Mr. Russell have supplied. Their sources of statistical information were not only the official mortality data of England and Wales but the clinical records of three great hospitals—St. Bartholomew's, the London, and St. Thomas's.

From the analysis of the official data the following conclusions emerge. The age distribution of mortality has changed during the last twenty years—in early childhood, 0–5, and in later life, ages over 45, the rates have increased; they have declined at intervening ages. The rate of mortality on males is 25 to 30 per cent. greater than on females, and among females over 15 single women suffer more than married women. There is little relation to urbanization, but some evidence that the rate in the southern areas of England and Wales is above the average. There is little seasonal variation. Using the social-economic classification of the Registrar-General it is found that appendicitis is one of the diseases having a higher rate of mortality in the higher social classes. Actually the rate of the highest social class is $2\frac{1}{2}$ times that of the lowest. In 1915–18 the mortality from appendicitis—like that from diabetes—decreased among females at ages over 55. In the second part of the report, which, in addition to the data of the three hospitals mentioned above, utilizes published records from other institutions at home and abroad, the authors provide many instructive tables. It is impossible in the available space to summarize these. The great decline in fatality is no doubt largely due to the admission of patients at an earlier stage of the disease as well as to surgical improvements. Thus Sworn and Fitzgibbon have compared the St. Thomas's Hospital experience of 1920–9 with that of 1894–1903. In 1894–1903 only thirteen out of 438 were assigned to the group acute appendicitis. In 1920–9, 1,340 out of 1,755 belong to that group. But comparisons of modern

[1] Medical Research Council. Special Report Series No. 233. H.M. Stationery Office. (1s.)

times suggest an improvement *within* each clinical or pathological group. Thus at the London Hospital the fatality rates on males for acute appendicitis and appendicitis with diffuse peritonitis were 2.9 and 28.8 per cent. in 1920–9. In 1930–5 the corresponding figures are 1.9 and something below 19.4 per cent. (the classification is not quite the same). At St. Thomas's, acute appendicitis and appendicitis with peritonitis showed fatality rates on males of 3.2 and 30.5 in 1920–9; in 1930–3, 1.8 and 23.2. It may be noted that the differences in the rates between the two hospitals have no material significance, because the methods of classification are not precisely the same. A serious defect of the statistical systems of the teaching hospitals has been, and perhaps still is, lack of uniformity in classification.

The authors lean to the opinion that dietetic habits are of aetiological importance, but express themselves with scientific caution. The report is, we think, of much interest and should be carefully studied, especially by those who have responsibility for the compilation of hospital data.

ORIGIN OF HEADACHE

In his book *Symptoms and their Interpretation* Sir James Mackenzie wrote: "There is much obscurity in regard to the mechanism by which the pain of headache is produced. I have made a number of observations in all kinds of headache and must confess I see no clear explanation. The conditions inducing the headache or associated with it are so varied that all sorts of theories can point to some circumstances for their support." This was in 1912. Since that time the hypothesis that headache is often or usually due to stretching of the parietal dura mater by an increase in intracranial tension has won wide acceptance, but like so many other hypotheses in medicine there have been few attempts to obtain any decisive facts in its support. In our present issue (p. 907) Dr. G. W. Pickering describes experimental observations in man concerning the mechanism of headache. The beginning of the work was the chance observation that headache may be consistently produced by intravenous injection of histamine, a normal constituent of many tissues of the body and a powerful vasodilator. An analysis of the time relations between the vascular events and the headache, and of the influence of alterations in the intensity of headache produced by changes in arterial and cerebrospinal fluid pressures, led to the unexpected conclusion that the pain was due to stretching of a sensitive structure lying in or close to the walls of the intracranial arteries. Subsequent experiments by Northfield[1] have shown that the vessels involved are probably branches of the internal carotid arteries, and not the meningeal arteries as Pickering originally supposed. This work introduced a new approach to the problem, and some progress has since been made in the clinical field. It seems that headache may arise from several distinct structures. Nodular or rheumatic headache is probably due to fibromyositis of the scalp and neck. The headache of migraine is believed by Graham and Wolff[2] to arise, in part, from dilatation of the arteries of the scalp. In meningitis Pickering suggests that pain is due to a chemical disturbance in the meninges. In cerebral tumour Northfield[1] considers that the pain arises, like that of histamine headache, from dilatation of the cerebral arteries. The headaches of pyrexia and after lumbar puncture also resemble that produced by histamine and may arise similarly, though as to the headache following lumbar puncture the facts put forward by Pickering also admit of the pain being caused by a change in the spatial relations of brain and dura mater, with consequent tension on the tentorium and dural sinuses. Penfield[3] regards traumatic headache as due to tension on sensitive adhesions between dura mater and brain. No new facts have been elicited in favour of the hypothesis that headache is the result of raised intracranial pressure, and it is being generally abandoned, even in the case of cerebral tumour. The most probable intracranial sources for pain are now thought to be the intracranial arteries and the dura around the large venous sinuses. These ideas as to the origin of headache must be regarded rather as working hypotheses than as established truths. But the progress made invites the hope that a symptom which has for long been one of the commonest, most unintelligible, and most intractable with which the practitioner has to deal may soon be susceptible of accurate interpretation.

[1] *Brain*, 1938, **61**, 133.

CLOSURE OF THE DUCTUS ARTERIOSUS

The time at which complete occlusion occurs of the ductus arteriosus, the short vessel which carries blood from pulmonary to systemic aorta in the foetus, bypassing the lungs, has been a matter of speculation. Hitherto it has been taught that with the beginning of respiration and expansion of the lungs the blood from the pulmonary trunk passes through the lungs and is diverted from the ductus, the latter becoming angulated and kinked as it enters the aorta. A paper by A. E. Barclay, Sir Joseph Barcroft, D. H. Barron, and K. J. Franklin,[4] describing an *x*-ray study of the ductus in lambs, indicates the time when closure occurs, and shows that the accepted explanations of the method of closure are inaccurate. The foetus was delivered by Caesarean section performed on the ewe near full term. A radio-opaque substance (thorotrast) was injected immediately into a vein, and serial radiographs were taken at short intervals by *x*-ray cinematography over a period extending to half an hour, the time between delivery and the first exposure being in some of the experiments as short as twenty-five to thirty seconds. Some remarkable

[2] *Arch. Neurol. Psychiat.*, 1938, **39**, 737.
[3] Ibid., 1936, **36**, 75.
[4] *Brit. J. Radiol.*, 1938, **11**, 570.

radiographs showing the ductus clearly are reproduced, but pictures indicating a patent vessel were not obtained after about one minute from the time of delivery. After this interval the ductus appears as a kinked and beaded structure, the course and calibre of which were seen to be continuously changing. These appearances are held to be due to strong localized muscular contraction in the wall of the ductus, occlusion of the lumen resulting at each point of contraction. This early closure could not be correlated with either the onset of respiration or the arrest of the circulation through the umbilical cord, for it could take place both before any air was seen in the trachea and before the cord was clamped. It is evident, therefore, that the hitherto accepted explanations of the mechanical method by which the ductus closes must be rejected, and that neither the expansion of the lungs nor the cutting off of the maternal circulation is the stimulus to closure. The origin of this stimulus must for the present be admitted to be unknown; the only obvious source is the altered external environment. These ingenious experiments have given brilliant results which will be of interest to the anatomist, the physiologist, and the clinician. The last-mentioned is closely concerned in the matter of uncomplicated patent ductus arteriosus, and in the light of the present work this congenital defect might be due either to the failure of the stimulus or to a defect in the contractility of the ductus itself.

HEREDITARY MELANOSIS IN FISHES

Spontaneous melanotic overgrowths, determined by genetic factors, occur in hybrids of two Mexican killifishes which, being handsome and well behaved, are popular inhabitants of "tropical" aquaria and are commonly known as "platys" (*Platypoecilus maculatus*) and "swordtails" (*Xiphophorus hellerei*). Häussler,[1] who apparently first recorded the overgrowths, enumerates the advantages of these fishes for genetic experiments; they are small, easily kept, breed prolifically, and have a short life span, whilst the overgrowths are easily seen. Descriptions of the fishes and the tumours, with beautiful illustrations, are given in a series of papers[2] by Reed, Gordon, and their colleagues. In platys and swordtails macromelanophores are restricted to scattered areas of the corium. In certain hybrids the macromelanophores multiply and almost completely replace the corium; they penetrate the fascia between corium and muscles, extend along the fascial planes, and surround the small muscle fibres, which atrophy. In some hybrids this condition has been reached at the day of birth. In older hybrids the deep invasion of macromelanophores continues, the corium becomes thickened, and, finally, true localized overgrowths occur and develop rapidly. The overgrowths are composed of pigmented cells usually spindle-shaped and much smaller than the macromelanophores; their origin is undecided. Gordon and Smith[3] state that the cells resemble those of human melanosarcoma. Other observers agree that the overgrowths are true tumours, though Häussler is not certain that they are malignant since some benign tumours in fishes infiltrate the surrounding tissue. Metastasis has not been observed, but, according to Haddow and Blake,[4] it is rare in fishes bearing undoubted malignant tumours. Haddow and Blake further record that transplantation of tumours in fishes is usually fatal. Successful transplantation of the melanotic overgrowths would give important information and might perhaps be achieved if new methods were used. The descriptions and a few of the published illustrations support the claim that the overgrowths are tumours, but additional evidence would be welcome. The overgrowths develop spontaneously in hybrids with an appropriate combination of Mendelian genetic factors. The platy contributes a dominant sex-linked factor for macromelanophores, while the swordtail contributes modifying factors which are also dominant. The degree of melanosis probably depends on the number of modifying factors present. Reed and Smith[5] find that modifying factors are supplied also by other species of platyfish occurring in different Mexican rivers, and that the degree of melanosis is most intense when the sources of the fishes used for hybridization are most widely separated. Häussler draws attention to an important distinction between the genetic determination of these overgrowths and the determination of tumours in mice. In mice the determination is ascribed to one or more genetic factors for tumour development, but in the fishes the genetic factors concerned are those which determine normal characteristics in the pure races, and it is only the unusual combination of factors brought about by hybridization which leads to overgrowth. It is possible, therefore, that genetic experiments on fishes may provide valuable data not obtainable from mice.

[1] *Z. Krebsforsch.*, 1934, **40**, 280.
[2] *Amer. J. Cancer*, 1931, **15**, 732, 1495, and 1524; 1937, **30**, 362.
[3] Ibid., 1938, **34**, 255.
[4] *J. Path. Bact.*, 1933, **36**, 41.
[5] *Amer. J. Cancer*, 1938, **34**, 543.

ST. HELENA IN WIMPOLE STREET

A reception by Sir Girling Ball, President of the Royal Society of Medicine, and Lady Ball was given at the Society's house on April 25 and was attended by a large company of Fellows and their friends. In accordance with tradition the brief lecture which is given on these occasions was on a non-medical subject, the lecturer being Dr. Philip Gosse, whose excursions into many fields of natural history and travel, as well as medicine and literature, are well known. On this occasion he spoke of St. Helena and pictured it in lantern slides. The reaction of most people to the mention of the name is, "Oh, yes, Napoleon," and they leave it at that. Dr. Gosse rather teased his audience by asking how many of them could give the precise location of the island, which is in fact in the South Atlantic, 1,200 miles from the west coast of Africa. There is attached to it much interest besides the memory of Napoleon. It is the oldest colony in the British Empire apart from Newfoundland, and the smallest imperial possession apart from Gibraltar. It has been British since 1651, except for a brief irruption

of the Dutch in 1673. Now poor and forgotten, it had importance in the days of the sailing ships, when the trade winds made it a frequent place of call. Its people are for the most part descendants of British sailors, with a mixture of East Indians and Africans, the Asiatic strain predominating. It has a formidable coast. Little wonder if Napoleon's heart sank when he first saw it, but once its rocky front has been penetrated it reveals itself as a sort of exotic garden, with a healthy and temperate climate. An endeavour is now being made to revive the fortunes of the islanders by encouraging the growth of lilies for export; the present industries of the island, according to Dr. Gosse, are flax-growing and the sale of postage stamps! Longwood, where Napoleon was lodged, is very much as it was during the six years he spent there. The garden is the same, so is the guard-room, and the bedroom where he died, also the window through which he trained his telescope. Altogether Dr. Gosse's pictures and description gave an impression of a place to which anyone who wants to get away from the conventions might happily escape, and of a community which is desperately poor but smiling and friendly. Dr. Gosse's remarks were supplemented by Sir Henry Galway, who was governor of St. Helena from 1902 to 1911, and who added one or two remarkable facts about the island. One of these was that even the oldest inhabitant has never seen a flash of lightning or heard the rumble of thunder. It is said that on the night Napoleon died a terrible thunderstorm shook the island, but Sir Henry Galway thought that from the meteorological history this is unlikely; it may well have been a gale of wind, for such gales are frequent. He also spoke of the St. Helenans as a healthy race, with a low death rate. The only endemic disease on the island, he said, was old age. Although it is in the Tropics St. Helena is innocent of tropical scourges, malaria is unknown, and the mosquito has never been seen. Moreover, its patron saint may have had a similar power to that of St. Patrick in Ireland, for a snake has never been discovered. One exception to this happy picture was afforded by one of Dr. Gosse's photographs, which showed a woman being taken to hospital with beriberi, a disease not uncommon on the island, owing to the extent to which many of the natives live on polished rice.

OPHTHALMIA NEONATORUM AND ITS PREVENTION

The April number of the *Journal of Social Ophthalmology* issued by the International Association for Prevention of Blindness (66, Boulevard Saint-Michel, Paris) is a symposium on the incidence of ophthalmia neonatorum and its prevention by Credé's method of instilling silver salts into the eyes of the infant immediately after birth. There are papers by Mr. A. H. H. Sinclair of Edinburgh, by Professor A. v. Szily for Germany, Dr. R. P. Wilson for Egypt, Professor Félix Terrien for France, Conrad Berens and Edith Kerby for the U.S.A., Mr. J. D. M. Cardell of London, Professor Luigi Maggiore for Italy, and Professor A. Vasquez Barrière for South America. The papers are admirably written, and for the most part have a clearness and brevity that invite attention. To each paper there is added a sufficient summary in both French and English. This issue of the *Journal of Social Ophthalmology* gives a first-class picture of the risks attendant upon ophthalmia neonatorum and the immense benefits that have followed the use of scientific methods of prevention. To-day we are apt to forget the ravages of the disease and the sorry tale of blindness of former days; but a comparison of the returns given for the South and for the North of the American continent points the moral.

THE SOLUBILITY OF SILICA

It is now only a matter of historical interest that the lesion of silicosis was once thought to be due to irritation by the hard sharp particles of the dust producing it. This idea of innumerable foci of minute trauma is false; silica is dangerous because it dissolves, and it is damaging only when in solution. A line of investigation prominent in recent work on silicosis is the study of this process of solution, of the solubility of different natural dusts, and the factors which influence it. Such studies have to take into account several peculiarities in the behaviour of silica suspended in a fluid medium. It has been found by E. J. King and M. McGeorge[1] that the rate of solution increases with diminishing particle size and with the quantity of silica added to a given volume of fluid. In such a mixture silica comes to be present in three forms—true solution, colloidal dispersion, and particles in suspension; to remove the last before estimating the amount dissolved it was necessary to centrifuge at a speed of over 10,000 revolutions per minute. These authors studied the solution of various siliceous materials in ascitic fluid and blood serum; beyond the fact that to reach a point near saturation took about eighteen days in serum and only five in ascitic fluid, there was no difference in behaviour between these two fluids. Quartz was easily the most soluble of the natural materials, reaching a concentration of 9 mg. SiO_2 per 100 c.cm., a value the same as that attained in experiments with freshly prepared pure silicic acid. Much lower values were obtained with various silicates and with sericite; it may well be asked whether the fact that this mineral is demonstrable in silicotic lungs post mortem is not due to its comparative insolubility and hence harmlessness. Perhaps the most interesting aspect of this study is the phenomenon of interference with the solution of silica by the presence of other materials. It was shown two years ago by Denny, Robson, and Irwin that aluminium powder and certain other substances greatly reduced the solubility of silica, and it was then suggested that a dust hazard might be materially reduced by adding to the dust some substance having this effect. E. J. King and W. Roman[2] have studied this phenomenon further, and it appears from their work that aluminium depresses the solubility of silica more

[1] *Biochem. J.*, 1938, **32**, 417.
[2] Ibid., 2283.

than any other material hitherto tested, but noteworthy effects of this kind are also produced by various stone dusts containing silicates. Coal dust has the same effect, not, according to these authors, by virtue of its carbon, but only in proportion to the amount of its silicate mineral content. The reason why silicates should interfere with the solution of silica is not certain, but one possibility is that their presence together leads to the formation of an insoluble compound of higher SiO_2 content than the original silicate. This action of silicates may have an important practical bearing, since silicosis is less frequent in coal-miners than would be expected from the amount of rock drilling which their work sometimes entails, and their comparative freedom from disease may be due either to the action of coal dust itself or to the stone dust used in coal mines to reduce the risk of explosion. Before anything was known of these problems of solubility it was an observed fact that stone-dusting had not caused an increase in silicosis; indeed, there was a strong impression that it had an opposite effect. Another author who has been studying this problem is A. R. G. Whitehouse[3]; his studies of the solubility of various minerals in 1 per cent. sodium carbonate yield values which, though higher, are proportional to those already quoted. He also confirms the interfering action of shale dusts, gypsum dust being peculiarly effective in this direction, and of coal dusts, the effect of which varied widely in degree, apparently, in his view, owing to such factors as variation in particle size; the view expressed by King and Roman that coal only acts by virtue of its silicate content is not mentioned.

[3] *J. indust. Hyg.*, 1938, **20**, 566

ROYAL MEDICAL BENEVOLENT FUND

Sir Thomas Barlow presided at the annual general meeting of the Royal Medical Benevolent Fund on April 25. The financial statement was presented by Dr. Lewis G. Glover, the honorary treasurer, who said that the figures for 1938 showed progress, though not to the extent that had been hoped. The subscriptions and donations had increased by only £56. They amounted to £13,632, to which had to be added a sum of £1,553 allotted by the Charities Committee of the British Medical Association, and £1,806 in the form of grants from other societies for special cases. But while the income side had thus barely maintained its level, the expenditure had gone up, with the result that there was an excess of expenditure over income of £712. Grants and annuities had increased by £1,126. Dr. Glover drew attention to the larger number of more substantial grants now made—ten people received a sum of £100 each, and twelve received from £50 to £100. The Fund was giving away just about double what it was accustomed to give ten years ago. There seemed also to be a change in the type of applicant. Some years ago it was the derelicts and woebegone people who held out their hands for this charity, but now there were applications from people who had come down in the world, often having held positions of high repute and done good social service. Some misfortune, not due to any fault of their own, had brought them to penury. There were also applications from the families of youngish doctors who had died prematurely. Dr. Glover spoke with special satisfaction of the annuitants, of whom there are 266. The amount allocated to them—£7,377—is met entirely out of the income from invested funds, and is not dependent on the vagaries of the subscription revenue. A year or two ago Dr. Arthur Holdsworth Davis of Bournemouth left to the Fund a valuable house which the testator desired should be used as a house of rest for the Fund's beneficiaries. It was found, however, that restrictions attached to the property would prevent it from being used for any other purpose than a private dwelling, and accordingly it had been sold, the proceeds invested, and from the income it was proposed, in harmony with Dr. Davis's wishes, to provide convalescent home and rest home facilities so far as possible for those in special need of them. Dr. Glover also presented the accounts of the Ladies' Guild, which, like the Fund itself, has let its heart outrun its resources, and ends the year with a debit balance of £449. The motion to adopt the report was proposed by Sir Humphry Rolleston, who spoke of the sympathetic handling of the Fund's allocations, and seconded by Dr. Henry Robinson, and agreed to. Mr. Bishop Harman proposed the re-election of Sir Thomas Barlow as President, and spoke of the pleasure with which they all saw him in the chair, and of Dr. Lewis Glover and Mr. R. M. Handfield-Jones respectively as treasurer and honorary secretary, and this also was agreed to. Dr. E. A. G. Dowling and Dr. F. C. Martley were added to the list of vice-presidents, and Sir Humphry Rolleston and Mr. Herbert Tilley to the Committee of Management. Dr. C. O. Hawthorne gave some account of the work of the Case Committee, and spoke of the urgency and pathos of many of the appeals with which it had to deal. The report stated that during the year 746 families were helped, of which 627 were former beneficiaries who had their awards renewed. Sir Thomas Barlow mentioned the need for a larger income, and especially for the enlistment of honorary secretaries in the various districts. He also expressed thanks to certain bodies and people who had assisted the Fund during the past year, notably the British Medical Association and its Charities Committee, the Medical Insurance Agency, and the medical and lay press.

The Croonian Lectures on "Visceral Neuroses" will be delivered by Professor J. A. Ryle before the Royal College of Physicians of London, Pall Mall East, S.W., on Thursday, May 18, Tuesday, May 23, and Thursday, May 25, at 5 p.m.

The Council of the London (Royal Free Hospital) School of Medicine for Women (University of London) announces that a Royal Charter was granted to the School on December 9, 1938. The School was founded in 1874, and in 1898 was registered as an association incorporated under the Companies Acts, 1862 and 1867.

WAR WOUNDS AND AIR RAID CASUALTIES

The following is one of a series of lectures on the Treatment of War Wounds and Air Raid Casualties recently delivered at the British Postgraduate Medical School

BLOOD TRANSFUSION

BY

JANET M. VAUGHAN, D.M., F.R.C.P.

I propose to discuss the problem of blood transfusion particularly from the point of view of a war-time emergency service, though much of what I have to say is also applicable to a transfusion service in times of peace.

Sources of Blood for Storage

Blood for purposes of transfusion may be freshly removed from a living donor and immediately given to the patient, or blood that has been stored may be used. Recognized sources of blood for storage are the placenta, the cadaver, and adult donors. It is obvious that under war conditions fresh blood cannot be used as a routine. The disorganization of means of communication caused by aerial bombardment makes it impossible to call upon donors at those times when blood is most needed. Medical and surgical personnel will be required to attend to patients during severe air raids or at periods of active fighting. They must administer blood and not spend time withdrawing blood. Donors obviously cannot be sent up to the front-line dressing stations. It will be absolutely essential, therefore, to have adequate supplies of stored blood.

Even in ideal circumstances the yield of blood from the placenta is small, on an average 80 c.cm. Though certain workers advocate its use at least in times of peace, opinion on the whole suggests that the labour involved in its collection is not repaid by the small amounts of blood which result (Goodall *et al.*, 1938; Howkins and Brewer, 1939; Page *et al.*, 1939; Halbrecht, 1939). Cadaver blood has not been used in this country. In Russia it is claimed to be satisfactory (Yudin, 1937). On theoretical grounds, in time of war it should prove an excellent source, since in persons dying a sudden death spontaneous fibrinolysis occurs, and it is not therefore necessary to use an anticoagulant. In practice, however, the collection of blood from war cadavers has, according to Saxton (1939) and Duran (1939), proved unsatisfactory.

Stored blood from adult donors has, however, been an almost universal success. Recent experience in this country confirms the work of Russian (Filatov, 1937; Bagdassarov, 1937) and Spanish workers (Duran, 1939) on this point (Elliott, Macfarlane, and Vaughan, 1939; Boland, Craig, and Jacobs, 1939). Biddle (1939) has for the last year used nothing but stored blood at the Ipswich Hospital. He claims that in giving 150 transfusions he has had fewer reactions than during the period when he used fresh blood. He had slight reactions in about 5 per cent. of his cases. Experience in the department of pathology of the British Postgraduate Medical School has been similar. In receiving fifty consecutive transfusions with stored blood four patients had a slight rise of temperature and four had mild rigors. Saxton has reported a higher reaction rate in Spain (1939), but it appears probable that complicating factors, to be discussed later, may have been present.

Such figures as are available suggest that the rise in red cells and haemoglobin following the use of stored blood is as satisfactory as that achieved by fresh blood, while improvement in the clinical condition of the patient is equally good provided that certain criteria of satisfactory preservation, to be discussed later, are adhered to (Elliott, Macfarlane, and Vaughan, 1939).

Blood Transfusion Institutes

Experience both in Russia and in Spain has shown that the best results are obtained if blood is withdrawn, stored, and distributed from special centres equipped for the purpose. It is obvious that the existence of such centres does not prohibit small and isolated units from arranging for their own supplies in times of emergency. It is, however, easier to ensure adequate sterility of apparatus and methods of collection with trained personnel working in suitably equipped centres.

Donors

It proved possible in Spain, in spite of war-time conditions, to organize a service of donors who came up to give blood at regular intervals. Blood was withdrawn apparently without ill effects as often as once every three weeks in many cases. On theoretical grounds it would be wise to have a longer interval—if possible at least three months, as is advised at present by the Red Cross Voluntary organization. Such a period will, however, clearly prove impossible in time of war: 500 to 600 c.cm. of blood is a reasonable amount to take from each donor. It has been suggested that it is wiser to take blood from a donor who has had no food for several hours. We kept a careful note of the time and character of the last meal in all the donors of blood for storage, and could not detect any relation between reactions and the recently fed donor.

In Barcelona, Duran (1939) stored only blood from Group IV Moss (O international), since under war conditions adequate grouping at the front proved impossible. In our limited experience here we found that it was wise to keep blood of all groups. This policy resulted in no wastage. If donors are to be bled as frequently as once a month they should be given large doses of iron, and if possible extra rations, at the time of withdrawal.

Apparatus

Various types of apparatus have been used for the withdrawal, storage, and administration of blood. No one method is at the moment completely satisfactory. On theoretical grounds the ideal technique for war-time should fulfil the following conditions:

1. The whole apparatus must be autoclaved in one piece ready for use without further manipulation if sterility is to be secured.
2. Blood must be collected without exposure to air for the same reason.
3. All glass-ware must be strong.
4. The container should be completely filled to reduce movement of blood to a minimum. Even slight shaking of blood after storage for longer than twenty-four hours is found to increase haemolysis, so that any technique that reduces agitation to a minimum is to be advocated.
5. No glass tubing should be left in contact with the blood after collection, as it is found to favour clot formation.
6. The technique of both collection and administration should be as simple as possible.

The method described by Duran (1939) fulfils the first four of the above conditions. The special storage

vessels required, however, even if somewhat simplified, are not easy to obtain on a large scale. Further, the method of collection and closing of the storage vessels appears too complicated for emergency conditions where extremely large quantities of blood may be needed.

The technique described by Elliott and others (1939) fulfils the first five conditions. The vessel is, however, completely filled, and in order to give blood by a pressure method a two-way tap and syringe is required. This can well be manipulated by a single individual, but it might be thought that it makes the apparatus too complicated for emergency use where skilled personnel will not necessarily be available.

Some modification of Boland, Craig, and Jacobs's (1939) method, where blood is stored under pressure, so facilitating administration, will probably prove the most satisfactory technique available should emergency immediately arise. Both collection and administration are easy and no complicated apparatus is required. The vessel is not, however, completely filled with blood, and if shaken in transit haemolysis is likely to occur. This risk is lessened if blood is transported immediately after collection, since red-cell fragility is not greatly increased in the first twenty-four hours of storage. Immediately after blood is collected air can be pumped into the container to raise the pressure, using a valve-tap somewhat on the principle of a bicycle valve, or pressure can be raised by the use of a Higginson syringe just before blood is administered. In giving blood to patients suffering from severe shock or haemorrhage whose veins are likely to be collapsed, some form of pressure is a great advantage. In many cases it saves the necessity of cutting down on the vein and inserting a cannula.

Method of Collection

In collecting blood for storage it is essential to adopt a strictly aseptic technique. We found three instances of contamination with *Staphylococcus aureus* in our first twenty samples of blood withdrawn with reasonable precaution. After that more rigid rules were laid down regarding asepsis, and no further contamination occurred. The operator wore a mask and scrubbed up as he would in the theatre. The skin over the antecubital fossa of the donor was cleansed with soap and water and then with alcohol. The whole apparatus, including the needle and preservative required for collection, was autoclaved together, so that it was not handled in any way, and it was so arranged that the blood was never exposed to the air.

Blood that flows freely into the preserving fluid keeps in more satisfactory condition than blood that flows slowly. It is therefore important to place the donor in a comfortable position with his arm near the edge of the arm rest, so that no kinking of rubber tubing can occur. If care is taken over the comfort and position of the donor it was found that 500 c.cm. of blood could be easily collected in from four to seven minutes. Before cleaning the donor's skin we placed an ordinary blood-pressure cuff round the upper arm and maintained a steady pressure of 80 mm. Hg. Boland and others (1939) have described the collection of blood into a flask containing a partial vacuum. Other workers have advocated the use of a Higginson syringe to maintain a negative pressure in the collecting vessel. Before withdrawing the needle from the vein, and after disconnecting it from the collecting flask, a few drops of blood should be taken into a tube containing 1 per cent. sodium citrate in normal saline for purposes of grouping and into a second tube for a Wassermann test. For convenience these two small tubes may be slipped under a rubber band attached to the collecting vessel before it is autoclaved.

Preservatives

Four preservatives have been used: (i) sodium citrate in varying concentration; (ii) physiological citrate; (iii) glucose citrate; and (iv) a mixed salt solution known as I.H.T. (see table). We at first added 10 c.cm. of 3.8 per cent. sodium citrate to every 90 c.cm. of blood, giving a concentration of 0.38 per cent. sodium citrate, approximately similar to that used by Saxton (1937). Bagdassarov has used a higher concentration of 0.54 per cent. Repeated reference is made in the literature to the use of physiological citrate solution, though I have been able to trace only one figure given for the exact

Table showing the Preservatives used in Storing Blood

Solution	Authority	Constituents	% Concentration	Volume of Solution	Volume of Blood	Final % Concentration
(I) Citrate	Saxton ..	Sodium citrate	3.8	10	100	0.34
	Vaughan ..	" "	3.8	10	90	0.38
	Duran ..	" "	4.0	10	100	0.36
	Bagdassarov	" "	6.0	10	100	0.54
(II) Physiological citrate	Page *et al.*	Sodium citrate	1.25	10	10	0.625
		Sodium chloride	0.85			0.425
(III) Glucose citrate	Domanig	Sodium citrate	1.0	10	10	0.5
		Glucose	2.0			1.0
		Sodium chlorate	0.2			0.1
	Duran	Sodium citrate	4.0	10	100	0.36
		Glucose	1.0			0.09
(IV) I.H.T.	Moscow	Sodium chloride	0.7	10	10	0.35
		Sodium citrate	0.5			0.25
		Potassium chloride	0.02			0.01
		Magnesium sulphate	0.004			0.002

composition of the solution. Page, Seager, and Ward (1939) used 1 per cent. of sodium citrate in 80 c.cm. of normal saline to which was added 80 c.cm. of blood. Glucose citrate is also mentioned, and the following formula is given by Domanig (1937): sodium citrate, 1 gramme; glucose, 2 grammes; sodium chlorate, 0.2 gramme; water, 100 c.cm. This is mixed with blood in equal quantities. Duran is reported by Ellis (1937–8) to use a final strength of 0.36 per cent. sodium citrate and 0.09 per cent. glucose (see table). The majority of workers have employed the citrate. We found that, however carefully blood was mixed with the citrate solution, clots always tended to form, which, though easily removed by filtration, made the administration of the blood rather more complicated than necessary. After twenty transfusions had been given with citrated blood we therefore used the anticoagulant first devised by the Institute of Haematology and Blood Transfusion at Moscow, commonly known as I.H.T. (Bagdassarov, 1937). The formula is: sodium chloride, 7 grammes; sodium citrate, 5 grammes; potassium chloride, 0.2 gramme; magnesium sulphate, 0.04 gramme; distilled water, up to 1,000 c.cm. It is mixed volume for volume with blood. Why this particular proportion of salts was chosen I have been unable to discover. Results with its use proved satisfactory, and no further trouble with clot formation was experienced. All observers agree that considerable dilution of blood for storage is an advantage; haemolysis occurs less readily, and, since stored blood anyhow tends to be sticky, dilution facilitates administration. As much as 2,600 c.cm. of mixed blood and I.H.T. has been given to a patient with no ill effects.

Grouping

This is not the place for a discussion of the technique of blood-group determination. It is necessary, however, to emphasize that accurate determination of blood groups is essential to the success of any transfusion service. Severe reactions are almost invariably due to the administration of incompatible blood. Such a mistake usually results from the use of weak test sera. All serum should have a minimum titre of 1 in 100 at least if it is to be kept for any length of time, and preferably higher. It is not always easy to find individuals with such a high titre. One of the most important tasks of any large transfusion service should be to guarantee a supply of such serum.

No serum, however good, should be kept for more than six months. It should not be stored in small capillary tubes for longer than a few weeks. Serum is best kept in bulk in 5-c.cm. ampoules, and a small supply should be put up in capillary tubes for immediate use. It is probable that many of the severe reactions following the use of stored blood in Spain were due to wrong grouping dependent upon unsatisfactory supplies of test sera, rather than to any inherent fault in stored blood. If possible cross-matching between recipients' serum and stored corpuscles should be carried out, but in times of emergency this may be a counsel of perfection.

Storage: Temperature and Duration

We employed a temperature of 4° C. for storage of blood. Satisfactory results have been reported with storage at a temperature as low as 1° C. and as high as 7° C. (Bagdassarov, 1937; Boland *et al.*, 1939). Haemolysis occurs if blood is frozen.

All observers agree that blood begins to deteriorate after the fifteenth day of storage, though it can be given without ill effects after storage for thirty-four days. We purposely kept some samples of blood so as to test the results of its administration, and found that even when it was thirty-three days old the patient seemed none the worse for its administration. That after the fifteenth day less satisfactory results are obtained is probably dependent upon the fact that the red cells become increasingly fragile about this time and haemolysis increases rapidly. The tendency to haemolysis becomes evident in citrated blood rather earlier than it does in blood preserved in I.H.T. Elaborate studies of the effect of storage, both upon red-cell characters and the biochemical composition, have been made by Russian workers and are summarized by Filatov (1937). The sugar content decreases from the second day of storage, while the lactic acid content increases, together with the inorganic phosphorus. Haemoglobin becomes more stable. The albumin and globulin contents are constant for at least fourteen days. The reaction becomes increasingly acid. Complement is completely destroyed in fifteen days, and after seven days is reduced to 50 per cent. The red cells remain unaltered for fifteen days; after that time they begin to show great variation in size and shape, and there is a rapid increase in cell fragility with increasing haemolysis. The reticulum is lost after five days, presumably owing to ripening of the young red cells. There is a gradual decrease in agglutinability. The sedimentation rate is gradually slowed. The platelets are said to have completely disappeared by the fifteenth day, changes beginning on the first day of storage. There is considerable divergence of opinion about the effect of storage upon white cells. Filatov (1937) believes that degeneration begins between the third and fifth days. Irger (quoted by Filatov, 1937) goes so far as to maintain that 57 per cent. of the white cells are intact on the twenty-fifth day. In practice it is found that if the plasma immediately above the sedimented red cells is amber rather than red in colour no excessive haemolysis has occurred and the blood is suitable for use.

Sterility

The literature contains few precise statements concerning the sterility of blood withdrawn for storage. In our own series of fifty samples blood was withdrawn by means of a capillary pipette from the main lot, for purposes of culture, the day after collection. Four tubes containing heart broth were inoculated, two with 2 c.cm. and two with 1 c.cm., one from each set being incubated aerobically at 37° C. and the other two anaerobically. Cultures were plated out daily for fourteen days. Three cases of contamination with *Staphylococcus aureus* occurred in the first twenty of the fifty samples collected. The remaining thirty were sterile. It is possible that this high rate of contamination was in part due to technical factors which, as already discussed, were later eliminated. The contaminant usually grew in about half the tubes and did not develop until the sixth day of culture. Dr. T. C. Stamp, to whom we are indebted for arranging for these tests, believes that cultures should be kept under observation for at least one week before reporting a negative. Aratyunjan (quoted by Filatov, 1937) reports 8 per cent. of contaminations in a series of sixty-five samples; Shorina, 3.9 per cent. of infections (quoted by Filatov, 1937). Saxton reported a much higher rate of contamination in Spain. It is likely that under the stress of war-time conditions sterilization of apparatus was far from satisfactory. Any handling of the collecting apparatus, such as putting on a needle sterilized by boiling rather than using one attached to the rubber tubing before autoclaving, we found increased the contamination rate. Unless contamination was gross we were unable, on naked-eye examination, to detect any difference between sterile and infected blood. Biddle, who tested a few only of his 160 lots of blood, found them all sterile. Boland *et al.* (1939), out of forty samples of blood cultured, found two to be contaminated with *Staph. albus*.

Available evidence suggests that if the blood is withdrawn with a careful aseptic technique the risk of contamination is slight. In times of peace culture should be a routine. Under emergency conditions it would be impossible to employ this additional safeguard. Duran (1939), in his latest apparatus, stores the blood in contact with oxygen. He considers that anaerobes obviously cannot grow in these circumstances, while aerobes, if present, consume the oxygen, so that the blood, which should be bright red, becomes dark in colour. In this way, in his opinion, contamination is readily detected without the necessity for culture. We found one positive Wassermann reaction in a group of fifty donors; Biddle (1939) found none.

Method of Administration

Stored blood can be administered by ordinary gravity, by some form of pressure apparatus, or as a continuous drip. It must always be filtered. In Spain, we believe filtration was effected at the base soon after withdrawal of the blood (Duran *et al.*, 1937). We either poured the blood through sterile muslin when it was given by the continuous-drip method, or passed it through a round glass bulb containing glass-wool before it reached the patient's circulation when gravity or pressure apparatus was used. Boland *et al.* (1939) used about 40 c.cm. of glass shot (diameter 2–3 mm.), added to each bottle before autoclaving. It is essential to mix and warm the blood before administration. This can be done by standing the container in water at 40° C. for about fifteen to twenty minutes and rotating it gently at intervals. It is also an advantage to have some form of closed container for keeping the blood warm during administration. A metal water-bath kept in a cork-lined plywood case serves this purpose well. Special care is needed in cross-matching, since there is some evidence of a definite decrease in the agglutinogen content of preserved red cells. Duran (1939) pooled all blood taken from Group IV donors and sent out mixed lots for therapeutic use. He found this method satisfactory, and it obviated all need for cross-matching.

Transport

If the best results are to be obtained with stored blood it is essential that it should be kept at a low temperature until immediately before use. Blood that has once been warmed even for a short time tends to deteriorate more rapidly than blood kept at a steady low temperature. Special refrigerator vans were used successfully in Spain for the transport of stored blood up to front-line hospitals. In designing such transport vans it is important to remember that stored blood should not be shaken more than is absolutely necessary. Transport vehicles should therefore be fitted to carry containers in a steady upright position. For the transport of small amounts of blood in times of peace the metal water-bath and cork-lined box used for keeping the blood warm during administration may equally well be used for keeping it cold.

Indications for Transfusion of Blood

The relative merits of gum saline, glucose saline, and blood transfusion are always a subject of debate. The chief value of transfusion is its immediate effect in increasing blood volume, plasma proteins, haemoglobin concentration, blood platelets, and other factors concerned in blood coagulation. In some instances it may act as a stimulus to blood regeneration (Vaughan, 1936). In time of war, transfusion is required primarily for patients who have had recent severe blood loss. The indications for transfusion in such cases must be largely clinical, since owing to the concentration of blood that occurs the red-cell count and haemoglobin estimation may be normal or even polycythaemic. Restlessness, pallor, dyspnoea, a systolic blood pressure of 70 mm. Hg or less, and a rising pulse rate are indications that blood transfusions are needed. Transfusions of fresh blood are also of definite value in patients with prolonged sepsis and anaemia, due, for instance, to a gunshot wound that fails to heal. Experience in Spain suggests that possibly stored blood is not so effective in such cases, but carefully controlled observations on this point are still lacking.

Experience has shown that stored blood is life-saving both in time of war (Saxton, 1937) and in time of peace (Elliott *et al.*, 1939). It is clear, however, that much still remains to be learnt about the most satisfactory methods of preservation, about the changes that occur during storage, and about its value in conditions other than sudden haemorrhage.

I must express my gratitude to Dr. Duran Jorda for the information he has given me about his experience with stored blood in the Spanish war.

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PREVENTION OF BLINDNESS

GENERAL ASSEMBLY OF INTERNATIONAL ASSOCIATION

A general assembly of the International Association for the Prevention of Blindness, which has its headquarters in Paris, was held in London on April 19 during the period of the annual congress of the Ophthalmological Society of the United Kingdom, the proceedings of which were reported in the *Journal* last week (p. 887). Dr. P. BAILLIART, the president, gave a brief address of welcome, and presented the gold medal of the association to Dr. PARK LEWIS, who, in accepting it, recalled the history of this movement. In 1909 at the International Ophthalmological Congress at Naples a proposal was made for an organization of this kind, but not until 1929, at the congress held in Holland under the presidency of Professor Van der Hoeve, did the association come into being, along with the International Organization against Trachoma.

Prevention of Ophthalmia Neonatorum

The meeting then received a report by Dr. A. H. H. SINCLAIR (Edinburgh) on ophthalmia neonatorum in Great Britain, particularly in Scotland, where, he said, the new rules framed by the Central Midwives Board for that country provided for the application of the Credé method of prophylaxis, midwives being required to take precautionary measures, including the instillation of 1 per cent. silver nitrate drops. In view of the fact that blindness or serious impairment of vision still occurred it was considered that these drops should be used as a routine measure for prophylaxis; no substitute had an efficiency equal to that of silver nitrate. The arguments against the use of silver nitrate by midwives were no longer valid, as their training had now reached a standard sufficiently high to make the method safe in their hands. He also discussed the treatment when the disease had become established, and expressed the hope that M & B 693 for gonococcal ophthalmia, and prontosil for pneumococcal and streptococcal cases, would fulfil their early promise, and that venereal disease in the mother, which at present constituted the greatest menace to the eyesight of the child, might be brought under control.

Professor VON SZILY (Germany) declared that the prophylactic method of Credé should be applied thoroughly and conscientiously in every case, as prescribed in the regulations for midwives in the Reich since 1920. The compulsory notification of all cases of gonococcal ophthalmia of the newborn should be strictly observed. This method offered the best assurance that all suspected cases of blennorrhagia received special treatment at an early date. Dr. R. P. WILSON (Egypt) touched on the interesting fact that ophthalmia neonatorum is rare in Egypt. It had been for centuries the tradition and superstition of the native midwives to put either a mixture of onion juice and salt or the juice of a lemon into the eyes of newborn children. This strange and crude practice might be an important factor in the prevention of ophthalmia neonatorum in Egypt and surrounding countries where it was also followed, seeing that lemon juice had a high percentage of free citric acid, and onion juice contained allyl sulphide, which also had powerful germicidal properties.

Professor F. TERRIEN (France) said that on the basis of replies from almost all the French maternity clinics it appeared that the instillation of silver nitrate, generally 1 per cent., immediately after birth and before the cord had been ligatured, was carried out in almost every case. The desirability of this measure was laid down by the Académie de Médecine in 1937. Dr. J. D. M. CARDELL recalled the fact that when in 1881 Credé introduced his method it was in the form of 2 per cent. silver nitrate drops instilled into the eyes of the newborn child, thus at once achieving a dramatic reduction in the incidence of ophthalmia neonatorum, the incidence in the Leipzig lying-

in hospital falling from 10 per cent. to 0.15 per cent. Most people nowadays used a 1 per cent. solution, owing to the occasional intensive reactions to which the 2 per cent. gave rise, so that it might be said that Credé's method was not strictly carried out. For use by midwives a 1 per cent. solution was quite adequate. Dr. Cardell said that the use of sulphanilamide and the other new chemotherapeutic preparations had not so far proved very satisfactory in this field, judging from the experience at St. Margaret's Hospital, London, but the number of cases was not yet sufficient to justify a definite appraisal.

Professor S. MAGGIORE (Italy) said that Credé's original method (2 per cent. silver nitrate) was applied in Italy in about one-third of the cases; in the remainder a weaker silver preparation was preferred. Dr. CONRAD BERENS (United States) sent an elaborate paper detailing the application of the Credé method in the United States. Silver nitrate in ampoules was distributed free by the health departments in most of the States, and many States included on birth certificates a question concerning the use of a prophylactic in the eyes of the newborn.

Dr. SOMERVILLE-LARGE (Eire) gave some figures relating to a three-year period in Dublin, where there had been thirty-four cases of ophthalmia neonatorum out of 34,867 births. Of a total of thirty-nine cases, including five outside Dublin, twenty-one had been cured, eight had permanent damage in one eye, and six in both eyes. The other four had died while under treatment, and in two of these cases the fact that the child had a severe ophthalmia neonatorum was a directly contributing cause. Dr. H. GRADLE (United States), Professor W. MELANOWSKI (Poland), and Dr. LÉON COPPEZ (Belgium) gave further statistics for their respective countries, and on the motion of Professor MAGGIORE the meeting agreed to request the public health departments in the various States to take all legal measures to ensure the rigorous application of the Credé method, and also to take steps to combat venereal disease in the pregnant woman. Before the meeting closed Mr. JAMES MINTON showed a film illustrating preventive measures against industrial eye injuries.

INTERNATIONAL ORGANIZATION AGAINST TRACHOMA

The annual meeting of the International Organization against Trachoma was held in London on April 21, and was presided over by Mr. A. F. MACCALLAN. This meeting also took place during the period of the Annual Congress of the Ophthalmological Society of the United Kingdom. The objects of the Organization, Mr. MacCallan said, were threefold: to hold annual meetings for the discussion of different aspects of trachoma; to assist in the publication of an international review; and to encourage research into aetiology when money was granted for that purpose.

In London, Mr. MacCallan continued, trachoma was met with not infrequently among immigrants from other countries; it was also found among British children who had been living in Egypt or India. Occasionally persons of good social status who had never been out of England became infected. Among these it was inconceivable that the louse could have played such a part as had been suggested. The types of trachoma met with in England conformed to the clinical classification known as "MacCallan's stages." Stage I initiated the disease, which might be follicular or of the generalized lymphocytic type; Stage IIa exhibited bleb-like excrescences or swollen follicles; Stage IIb showed a papillary hypertrophy; Stage III ushered in cicatricial changes in the conjunctival epithelium; and in Stage IV the conjunctival epithelium was replaced by scar-tissue epithelium, and the trachoma virus was no longer active. During the last few years in London he had seen all these stages, even among patients of good social standing, but, of course, in Egypt and on the north coast of Africa they were complicated by superimposed bacterial conjunctivitis not seen in England. He went on to refer to some recent work of Birch-Hirschfeld, who had shown that connective-tissue development was the supreme characteristic of trachoma, and that this was a real hyperplasia, not merely a process of repair. This occurred in the subconjunctival tissue, in the pretarsal tissue, and, not least, in the tarsus itself. Foci of inflammation might be found in the substance of the tarsus at quite an early stage of the disease. The implications as regards treatment were obvious. The application of drugs to the tarsal conjunctiva could not be expected to influence the invaginated and infected epithelial cells in the subepithelial and deeper tissues. Expression of the bleb-like excrescences in Stage IIa could have no effect on the deeper leucocytic infiltration. The use of chemotherapy could not be expected to do more than kill the virus, leaving untouched the leucocytic infiltration and the fibrous hyperplasia. In the consideration of chemotherapy the fact should be mentioned that fibroblastic activity was particularly prominent where the infiltrating cells showed signs of degeneration. Birch-Hirschfeld assumed that, by the liberation of certain substances from the degenerated cells, chemical reactions took place which stimulated the fibroblasts to proliferate. If this was the case the poisoning of the trachoma virus by chemotherapeutic agents would not bring fibroblastic activity to an end. Infection with trachoma was never followed by complete *restitutio ad integrum*. Even in aborted cases a characteristic vascularization of the upper fifth of the normally clear cornea remained. The operation of tarsectomy, devised by Heisrath and Kuhnt, was of value in such cases, but it should not be carried out when bleb-like excrescences were present in the fornical conjunctiva; these should be removed by mechanical treatment previously.

Incidence of Trachoma

Representatives of different countries then spoke of the incidence and clinical types of trachoma encountered by them. Dr. LAVERY (Eire) said that trachoma as a cause of blindness was a major problem in his country. The number of cases of trachoma was not high, but the incidence of blindness or near-blindness occurring among such cases was very high. Trachoma was often a family affair. He had found it in brothers attending different classes in schools, no other school children being affected. Dr. H. GRADLE (United States) said that in North America the virulence of trachoma was associated with the state of racial sanitation and hygiene. The cleaner the people the less virulent was the trachoma. The complications varied with the steadfastness or otherwise with which the patient pursued treatment. Professor W. ROHRSCHNEIDER (Germany) said that in his country trachoma was an endemic disease occurring in only a few districts, chiefly along the eastern frontier. In East Prussia it was usually an illness of the poorer classes of the population, mostly transmitted within the family. The louse played no part. The connexion, taken for granted by some French investigators, between the geographical spread of trachoma and the extension of spotted fever by means of the clothes louse did not hold good at all events for the trachomatous areas of Germany. Mr. ARNOLD SORSBY said that trachoma was progressively diminishing. In Glasgow, where it was notifiable, the number of cases had fallen from 112 in 1915 to fifteen in 1937. In London the same tendency was shown, as instanced in the diminishing number of cases concentrated at the White Oak School at Swanley. There was no special provision in London for adult cases or for following up infection in the home, yet London showed the same declining incidence as elsewhere.

Treatment of Trachoma by Sulphanilamide

Dr. H. GRADLE (United States) said that he had information of 772 cases of trachoma treated by sulphanil-

amide and observed over a period of from three months to one and a half years. In from 60 to 70 per cent. of cases of trachoma Stages I, II, and possibly III the condition appeared to be arrested by the use of sulphanilamide provided the patient could tolerate the drug. Within two days of starting treatment the subjective symptoms were relieved. Dr. KHALIL (Cairo) on using prontosil had found an instantaneous change in the appearance of the congestion and thickening of the conjunctiva. Dr. SPENCE MEIGHAN (Glasgow) had treated six cases, with quite definite improvement in two, but it was too soon as yet to give a considered judgment. In one case the treatment had to be stopped on account of cyanosis. Dr. A. J. BEDELL (New York) said that these drugs were of very great service, particularly in the early case, but unless a sufficient dosage was used good results were not likely to be forthcoming. His practice had been to combine sulphanilamide with sodium bicarbonate. Care must be taken to determine the action of the particular form in which the sulphanilamide was administered. In certain conditions the treatment was apt to induce peripheral neuritis most often involving the brachial plexus or ulnar nerve.

Mr. MACCALLAN said that he had received a communication from Drs. Jasseron and Morad in Algeria, who obtained rapid and constant results in treating trachoma with one of the preparations of this group; and another from Dr. Busacca in Brazil, giving it as his opinion that this form of chemotherapy had no influence on purely trachomatous conditions. The opinion of those who knew most about sulphanilamide and its congeners was that they were of no use against any virus. If trachoma was a virus disease and sulphanilamide gave a good result, then the virus of trachoma must be unlike any other.

BRITISH CONGRESS OF OBSTETRICS AND GYNAECOLOGY

PROCEEDINGS IN EDINBURGH

The eleventh British Congress of Obstetrics and Gynaecology took place in Edinburgh in the early part of April, the scientific meetings being held in the recently opened Simpson Memorial Maternity Pavilion of the Royal Infirmary. The main subject for discussion was "Pain in Labour and Methods of Alleviation." Before the opening paper Professor R. W. JOHNSTONE, in his capacity as President, extended a welcome to those attending the Congress, and intimated with regret that owing to illness neither of the official guests, Professor Wagner of Berlin and Dr. Samuel Meaker of Boston, was able to be present.

Nature of Pain in Labour

The discussion opened with a paper by Professor CHASSAR MOIR on "The Nature of the Pain of Labour," in which he reviewed the theories regarding visceral sensation. He stated that considerable differences of opinion seemed to be held on this subject. The major point of variance was that, while some emphatically held that pain could not be experienced in a viscus, others believed that true visceral pain did exist apart from, and in addition to, a referred or projected sensation. They further believed that the apparent insensibility was due to the fact that the viscera would respond to an appropriate stimulus, which in the case of the gut and other hollow organs was muscle-wall tension. It was generally claimed that impulses from the uterus which gave rise to pain passed by way of the autonomic nerves to the central nervous system. Reference was made to the fact that the exposed but unanaesthetized uterus could be freely incised without sensation to the conscious patient, but traction on the uterine supports or pressure of a clamp on the mesosalpinx would cause intolerable pain. In contrast to the general insensitiveness of the uterus, forcible dilatation of the cervix would always provoke severe pain, both in the non-pregnant and the pregnant woman.

To obtain exact knowledge of the relation of the uterine contraction to the time of onset and duration of the pain experienced by the patient, Professor Moir recorded in graphic form the waves of intra-uterine pressure as recorded by a small balloon inserted high in the uterus above the presenting part. He found that pain did not start until some fifteen seconds after the onset of the uterine contractions, and is usually continued until the contractions had quite subsided. It appeared that the lag was most marked in the early first stage and lessened as labour advanced. He further noted that the pain was not necessarily proportional to the strength of the uterine contractions, and formed the opinion that the pain of labour, or the major part of it at least, was not directly due to muscle contraction but was caused by a stretching of a portion of the lower uterus and cervix. In Professor Moir's opinion the uterus behaved like other abdominal organs with respect to its sensibility and response to painful stimuli, and there was no conclusive evidence to show whether the pain of labour was a true visceral pain or was a pain experienced in related somatic areas; he emphasized the evidence in favour of the view that the pain of labour was not caused by the direct effect of muscular contraction but by stretching and deformity of the lower uterine segment, cervix, and adjacent tissues. Stretching of the vagina and perineum was the main cause of pain in the late stage of labour.

Relief of Labour Pain

Dr. JOHN STURROCK presented a paper on "The Relief of Pain in Labour," in which he reviewed the methods used and concluded that no one method had proved satisfactory for all cases in all circumstances. In obstetrics, however, the conditions to be fulfilled before a method could be regarded as satisfactory and safe were so much more numerous, varied, and complicated that so far the ideal drug or combination of drugs had not been discovered. Deep analgesia in both primiparae and multiparae carried with it serious risks on its own account besides complicating the management of labour. Obstetrical teachers should give more definite and detailed instruction to students regarding the use of sedatives and anaesthetics in labour. Too often was this art picked up haphazardly after graduation, and it must be remembered that poor selection of a method and faulty administration were the common causes of disaster, especially in this country where chloroform was so extensively employed. The prospective mother, when she inquired, should be told that with due regard to her own and her baby's safety something could and would be done to ease her pain, but that it was not possible to promise her that she would not know anything about the labour.

As to the method to be used it was preferable to choose the most appropriate one at the time of labour. In many multiparae analgesia during the second stage was all that was required, while in the longer labours of primiparae the selection of the best way to relieve pain in the first stage depended on the individual's threshold for pain, the presence or absence of a degree of uterine inertia, and the possibility of delay from complicating mechanical factors. Throughout the ante-natal period there was very commonly a deep-seated fear and dread of labour which, by proper discussion with and education of the patient, could at least be greatly diminished. The importance of allaying this apprehension and preventing its reappearance during labour itself must never be forgotten, as it formed a significant fact in avoiding the psychological magnification of pain. In the first stage of labour morphine, chloral hydrate, and bromide were still relied on most frequently in domestic practice, while "twilight sleep" could be added with safety provided circumstances permitted its proper administration and supervision. The barbiturates played an important part in the newer methods, but they could not be said to have solved the problem so far, and unless other members of the group with a more favourable pharmacological action were produced they might gradually fall into disuse. During the second stage of labour chloroform, properly administered, was of great value

as an analgesic, and was still extensively employed in this country, especially in domestic practice, but its dangers and limitations, more particularly when used with an anaesthetic, must be recognized. Nitrous oxide and oxygen, if available at the hands of an expert anaesthetist, was by most recognized as the method which approached nearest the ideal. In the hands of the inexperienced, however, it must be regarded as a dangerous anaesthetic in labour, especially to the infant. If this was to remain the method of choice, maternity hospitals would have to consider the appointment of resident anaesthetists. Gas and air, which conferred a certain amount of relief, had been judged so safe that, after special training, a midwife could use the method on her own responsibility, but even with the most modern apparatus the method was cumbersome, and the supply of gas, except in large centres, was a difficulty. Rectal instillations of paraldehyde or avertin alone had not proved efficient, although as part of a synergistic technique they were useful. The more extended use of local and regional anaesthesia merited further consideration, especially for perineal repairs, while spinal anaesthesia was held by an increasing number of people to be contraindicated during pregnancy for either abdominal or vaginal delivery at any period of gestation.

Dr. Sturrock concluded by saying that it was impossible to express any opinion to date on the newer methods, such as cyclopropane, divinyl ether, evipan, or pentothal sodium, because their use has been so limited, but, at first sight, they did not appear to offer any great advantages compared with the better-known methods. It was, however, only by testing out each new preparation in actual practice over a large enough series of cases that true values could be estimated and any advance made towards the discovery of a method which would ensure efficient relief of pain in labour.

General Discussion on Labour Pain

In the discussion which followed Mr. J. E. STACEY stressed the importance of amnesia and advocated the judicious use of hyoscine. Professor FARQUHAR MURRAY advocated the use of "a safe mixture," such as bromide and chloral with a small amount of tinct. opii, which might be given four-hourly, and the mental relaxation obtained would be followed by good physiological pains. Dr. BETHEL SOLOMONS emphasized the dangers of chloroform when given by the unskilled, and advocated increased facilities for skilled anaesthetists in hospitals to-day. Dr. DORIS GORDON said that the higher the mental standard of the patient the more was apprehension of labour present, and thought that if a 40 per cent. diminution in pain could be guaranteed much of the apprehension could be obviated; also, with the higher senses controlled the labour proceeded unimpaired by psychic factors.

Mr. ARTHUR GEMMELL reported the use of urethane in association with morphine in some seventy cases, with successful results in 31 per cent. With nembutal there was an increased proportion of forceps deliveries and stillbirths. Dr. J. S. STEELE gave an account of 200 labours where pentothal acid had been used orally; he found no harm to the mother or the child and obtained good co-operation in 80 per cent. of the cases. The degree of analgesia was good, but amnesia was not a marked feature.

Dr. WILLIAM LISTON submitted a record of forty cases treated in the Royal Maternity Hospital, Edinburgh, with seconal: four capsules of 1½ grains were given when labour pains were established; at approximately three fingers dilatation of the cervix. If delivery was not imminent within six hours two further capsules might be given and perhaps repeated on one further occasion. He reported that in 92 per cent. of cases amnesia was satisfactory, and in 60 per cent. of these was complete. The forceps rate in these cases was 32.5 per cent., as against the usual hospital rate of 12 per cent. over the last five years; 32 per cent. of the children born failed to breathe at once, but in no case did the child's condition give rise to anxiety.

Professor JAMES HENDRY said that it was essential that the obstetrician should have absolute confidence in the method which he might adopt, and reported a series of 1,000 cases in which scopolamine and morphine had been used, and in only 5 per cent. of cases were results unsatisfactory. He found that the third stage of labour was prolonged to some extent, but no anxiety or difficulty over the management of this stage resulted. He pointed out that many of the ill effects resulting from chloroform analgesia or anaesthesia were due to neglect of metabolic principles, and stressed the importance of giving the patient adequate amounts of glucose during labour.

Mr. EARDLEY HOLLAND regretted the tendency for the "bottle and machine" to replace the doctor, and he believed that relief of pain in labour could to some extent be obtained by an appropriate diet during pregnancy, such a diet being of high vitamin and mineral content and with starches reduced to a minimum, the patients being weighed regularly. In such cases the labour seemed to be easier, and he drew a parallel to the athlete in training for prolonged muscular activity.

Professor LOWRY advocated the use of scopolamine alone, but with the warning that the drug might be found to be unstable, and for consistently good results a reliable source for obtaining the preparation was necessary. He found the Gwathmey technique to be troublesome, and said that the common danger with all methods in the hands of the inexperienced was the possible masking of coincident danger symptoms.

Pyosalpinx: Toxaemias

Dr. T. HAULTAIN read a paper on "Pyosalpinx and its Treatment," in which he reviewed eighty-four personal cases of definite pyosalpinx, fifty-four being acute and thirty chronic.

Of the acute cases thirty-four were treated conservatively, with ten failures. The conservative measures consisted of sedative treatment with morphine and either hot fomentations or cold ice-bags to the abdomen, these being continued until the temperature became normal. The sedimentation rate of red blood corpuscles was estimated on admission, and the further treatment was gauged by the increase in time taken for the sedimentation of the red blood corpuscles. In most cases hot vaginal douching was instituted at a temperature of from 108° to 112° F., and was continued for about a week, when sedimentation time was again estimated. If found necessary, treatment by pelvic diathermy or short-wave therapy was carried out for three or four weeks. Dr. Haultain agreed with the view generally held that cases of acute salpingitis should be treated conservatively, but with acute pyosalpinx the question of operation was an entirely different proposition, and he urged that operation should be undertaken on all cases where conservative treatment failed. He found the sedimentation rate of value in estimating the optimum time for operation, and also for the application of more intensive and drastic pelvic treatment. In most cases the operation performed was supravaginal hysterectomy with removal of the appendages. Posterior colpotomy was never performed. It was felt that the retention of ovaries, even should they appear to be fairly healthy, would in all probability give rise to future pain, and no marked or even moderate disturbance of a general or endocrinal nature was noted, any mild postmenopausal symptoms being easily checked with small doses of oestrin. Pelvic drainage was advised in cases where (1) rupture of the tube occurred before or during its removal; (2) the sedimentation time was under sixty minutes, and therefore the pyosalpinx was likely to contain virulent organisms; and (3) the adhesions had been so great that a raw area was left in the pelvis which could not be adequately peritonized and from which there was a certain amount of oozing.

Professor F. J. BROWNE and Dr. GLADYS DODDS presented a paper on "The Remote Prognosis of the Toxaemias of Pregnancy," based on a follow-up study of 400 cases in 589 pregnancies for periods varying from six months to twelve years. The patients were grouped as cases of pre-eclamptic toxaemia, eclampsia, hypertension, chronic nephritis, and recurrent toxaemia. The residual lesion after pre-eclamptic toxaemia was invariably hypertension, which resulted in 50.9 per cent. of cases. The older the patient, the

greater her parity, the higher the blood pressure during pregnancy, and the longer the duration of the illness, the greater seemed to be the liability to the ultimate recurrence of residual hypertension. The residual lesion after eclampsia was also found to be hypertension, and in this respect eclampsia was a more serious disease than pre-eclamptic toxaemia. Of the patients with hypertension 9.2 per cent. were dead within the twelve-year period; but the majority of those with simple hypertension passed through pregnancy without any demonstrable deterioration in the general condition. They found chronic nephritis complicating pregnancy to be rare—only seventeen patients in the series. The ultimate prognosis was bad, 29.4 per cent. dying in the twelve-year period. Pregnancy was also a serious risk to these patients, but in about 50 per cent. of cases the patient did not seem to be any the worse as the result of it. In most cases of recurrent toxaemia the patient was found to have had hypertension during the interval between pregnancies.

The first day's sessions ended with the showing of a film on "Roentgen Pelvimetry," made by Professor H. THOMS of New Haven, Connecticut.

Genital Hypoplasia

In the absence of Professor SAMUEL R. MEAKER his paper on "Female Genital Hypoplasia" was taken as read. In a series of one hundred nulliparous women he found that nine had uteri which presented the obvious stigmata of underdevelopment. He was of the opinion that the aetiology of genital hypoplasia was based on deficiency of endocrine stimulus, whether due to a primary failure of the glands themselves or to some depressed constitutional state reacting unfavourably on their function. Sterility and dysmenorrhoea of the spasmodic type were the symptoms usually complained of, and he found that amenorrhoea or other menstrual irregularity was not a characteristic symptom of hypoplasia. Professor Meaker drew attention to a new diagnostic sign, which he referred to as the "uterine index": it was a quantitative expression of the maturity of the uterus, the calculation being based on two measurements—one the length of the cervical canal from the external to the internal os, and the second the length of the utero-cervical canal from the external os to the fundus of the uterus. The index is calculated according to the formula $\frac{1}{2}\left(\frac{U-C}{C}\right)$, where C is the length of the cervical canal and U the length of the utero-cervical canal. Attempts to treat established genital hypoplasia in the adult woman had been uniformly discouraging, the growth impulse being lost after 20 years of age; local treatment proved particularly ineffective. In some cases, however, the growth impulse appeared to be dormant rather than extinct, and might be reawakened by the stimulus of a normal and satisfactory sex life. If pregnancy occurred some further differential development of the organs was assured, even when the result of conception was nothing more fruitful than miscarriage. Great interest attached to the fact that the hormones present in the urine of pregnant women were capable of provoking a prodigious response in the underdeveloped ovaries of mice and rabbits.

Emotion and Uterine Contraction

Dr. EDWIN ROBERTSON read a paper on "The Effects of Emotional Stress on the Contractions of the Human Uterus." Recording of the contractions had been made by a hydrostatic bag in the uterus. Sudden noises, the pain of a hypodermic needle, and even the suggestion of pain had produced unusual contractions of the uterus. It was noted, however, that these so-called emotional contractions were only precipitated during the secretory phase of the cycle. Punch curettes taken after each observation proved the luteal activity of the corpus luteum. Dr. Robertson suggested that the uterus, under these circumstances, might be stimulated to activity by direct nervous influences or by adrenaline. He had found no direct evidence favouring either suggestion, but reminded his hearers of a somewhat similar peculiarity found in the cat.

Trichomonas Vaginitis

A study of trichomonas vaginitis in hospital practice in Edinburgh was presented by Lieutenant-Colonel W. GLEN LISTON and Dr. W. A. LISTON. They found that trichomonas vaginitis was very prevalent among women, occurring in about one case in every five patients attending a hospital gynaecological clinic, and in almost half of the patients attending a venereal disease clinic for women. They found that the condition could be diagnosed by a careful clinical examination, but the diagnosis should always be confirmed by microscopical demonstration of the trichomonads. This was best done by staining dried films of the vaginal secretion by Leishman's method. They described the disease as assuming one of three forms: the acute, the subacute, and the chronic or latent. Exacerbations of the subacute or latent type might be induced by changes in the hydrogen-ion concentration of the vaginal secretion towards an optimal concentration required for the development of trichomonas, which was slightly to the alkaline side of *p*H 6. The disease was complicated by a gonorrhoeal infection in some cases; it was always associated with a purulent discharge, and almost always with an abnormal bacterial flora. *Trichomonas vaginalis* might develop in certain males, but in them the disease was a very rare occurrence; these infected males might be a source of reinfecting females cured of the disease. Colonel Liston and Dr. Liston gave a detailed account of the Trichomonadidae and described the method they used in preparing films to distinguish the different species of trichomonas by staining.

Hyperemesis Gravidarum

Dr. EBBE BRANDSTRUP of Copenhagen read a paper on "Some Problems concerning the Aetiology and Treatment of Hyperemesis Gravidarum." He began by stating that in Denmark vomiting in pregnancy caused the deaths of six women each year, necessitated thirty to forty therapeutic abortions, and caused illness and serious inconvenience to over 4,000 women. On the hypothesis that vomiting resulted from a hormonal insufficiency of the suprarenal cortex, therapeutic experiments were made with "corsunal," a freshly prepared suprarenal cortex extract, in a dosage of 20 to 30 c.cm. injected intramuscularly each day. Improvement was noted in many cases with the administration of suprarenal cortex, although Dr. Brandstrup admitted that the possible effect on some patients might have been due to suggestion. When an effect was obtained it seemed reasonable to look upon it as palliative and compensatory through increase in the liver glycogen and blood cholesterol. In six patients the gonadotropic hormone excretion was investigated, a total of forty-four hormone analyses being carried out on the collective output of urine, while the blood was examined for gonadotropic hormone twice weekly. In all cases the values were found to fall within the limits of normal variation in perfectly symptom-free patients in the corresponding months of pregnancy.

As to the pathogenesis of hyperemesis the conclusion arrived at was that the woman began to vomit owing to some unknown cause, and the further course of the illness might depend to a large extent on psychic factors. A state of inanition developed, of which want of glycogen in the liver was probably the most serious feature, even though the want of salts, water, and vitamin, together with the development of acidosis, were also important factors. In view of this, treatment consisted in psychic, sedative, and restorative therapy. Seven symptoms were considered important as indications for the interruption of pregnancy in association with hyperemesis: elevation of the temperature above 100.6° F. or persistent subfebrile temperature, persistent increase in the pulse rate over 100 per minute, jaundice, albuminuria, polyneuritis, ocular symptoms, and psychotic changes.

Ovarian Dysmenorrhoea

Professor O'DONEL BROWNE (Dublin) read a paper on "Ovarian Dysmenorrhoea: Its Aetiology, Diagnosis, and Treatment," in which he described the clinical entity of

ovarian dysmenorrhoea, which he found to exist in about 11.9 per cent. of all dysmenorrhoea cases, but might be present in association with uterine dysmenorrhoea, thus constituting "mixed" dysmenorrhoea. He described an examination technique to differentiate the two types, where the exact character and localization of pain produced by ovarian compression could be compared with that produced by passing a uterine sound. He found that true ovarian dysmenorrhoea could be completely cured by bilateral ovarian denervation, where under general anaesthesia bilateral division of the infundibular pelvic ligaments, their nerves and blood vessels, was effected at the brim of the pelvis through a mid-line lower abdominal incision. Of sixteen women considered as suitable subjects for ovarian denervation ten were completely cured.

Vaginal Implants in Uterine Cancer

Professor GILBERT STRACHAN read a paper on "Vaginal Implantations in Uterine Carcinoma." Apart from the rare cases of primary carcinoma of the vagina, he pointed out that this canal was affected secondarily in three main conditions—carcinoma of the cervix or the body, and chorion epithelioma, the involvement being thus always from above. In carcinoma of the cervix vaginal involvement most frequently was due to a direct spread, but might be due to a submucous induration or by discrete secondary growths occurring at an interval from the primary tumour with healthy vaginal mucosa intervening. He reported a series of 686 cases of carcinoma of the cervix since 1922 where 51.6 per cent. had a direct ulcerative spread to the vaginal vault, 17 per cent. deep submucous infiltration, and 4.3 per cent. discrete lower vaginal growths.

In a series of ninety consecutive cases of carcinoma of the body of the uterus vaginal implants were present in 19.3 per cent. In the case of corporeal carcinoma direct surface spread to the vagina only rarely occurred. In chorion epithelioma vaginal implantation was generally recognized as the most common extension of the growth. The prognosis in all cases was gravely influenced for the worse by the presence of secondary vaginal involvement, and the best line of treatment appeared to be the embedding of a sufficient number of long radium needles deep in the growth and parallel to the mucosa surface.

Recurrent Abortion: Male Sterility

Dr. T. N. MACGREGOR read a paper on "An Investigation of Cases of Recurrent Abortion and their Treatment with Progesterone," in which the findings of Browne and Venning as to secretion of gonadotropic hormone in normal pregnancy were confirmed. It was found that, normally, pregnandiol excretion roughly parallels the excretion of gonadotropic hormone, there being a peak about the sixtieth day, followed by a fall to a lower level which was maintained until the 200th day, when there was a second rise, the excretion then remaining high until just before parturition. Pregnandiol disappeared from the urine within two or three days of parturition. In cases of recurrent abortion successfully treated by progesterone the hormone excretion followed the normal course except that the early peak was not necessarily present. In unsuccessful cases the hormone excretion fell to a very low level just before abortion, and was usually subnormal throughout. In a series of twenty cases (twenty-two pregnancies) with a history of at least two successive abortions, there were fourteen live births under progesterone therapy. According to the calculation of Malpas, the expected number of live births was not greater than nine, but reasons are given for believing that even this is too high an estimate. In the same cases sixty-five previous pregnancies had resulted in only ten live births.

Mr. KENNETH WALKER and Dr. B. P. WIESNER presented a paper on "Male Sterility and Dyskyesis: A Study of the Paternal Factors in Miscarriage." They described the methods of investigation of the male, and advocated testicular biopsy in the majority of cases. A series of slides was shown illustrating the different abnormalities of the sperm cells, and attention was directed to such abnormalities being a cause of early miscarriage due to a primary fault in the ovum rather than to any uterine or endocrine dysfunction.

The concluding event of the Congress was a visit to the Institute of Animal Genetics, Edinburgh University, where Professor F. A. E. CREW received the visitors. The Pregnancy Diagnosis Laboratory was inspected, and demonstrations of the Aschheim-Zondek, Freidman, Hogben, and Kapeller-Adler tests for pregnancy were given. Dr. A. GREENWOOD demonstrated his work on a biological test for male hormone activity, and Dr. A. HAIN read a short paper on "The Hormone Levels Associated with Parturition."

EMPIRE RHEUMATISM COUNCIL

DUKE OF GLOUCESTER AT MANSION HOUSE MEETING

A meeting in support of the Empire Rheumatism Council was held at the Mansion House on April 25, when H.R.H. the Duke of Gloucester spoke on the Council's work.

The LORD MAYOR (Sir Frank Bowater), who presided, spoke of the Royal House as having worked nobly to justify the oldest and most honourable title given to kings and princes—that of shepherds of their people—especially in efforts to protect them from the ravages of disease. He recalled King Edward VII as the captain of the army enrolled against tuberculosis in this country. The City of London, too, had been a consistent supporter of medical research, and he was glad to offer the Mansion House now for the furtherance of the campaign against the rheumatic group of diseases.

The DUKE OF GLOUCESTER said that it was surely proof of the strength of mind of the British race that despite circumstances of no little discouragement attention should be given to a movement against a common enemy of human happiness. It showed that the nation was not suffering from nerves, and that it was confident of a happy outcome from the present difficulties. The Empire Rheumatism Council, of which he was president, had undertaken a task of great importance: to seek out the causes of rheumatic diseases and therefore the means of their prevention, and at the same time to plan and make generally available for present sufferers treatment for their cure and alleviation. In the United Kingdom there were over a million adult and 200,000 child sufferers from the disease, and other countries were afflicted to a like degree. A survey made in Massachusetts had shown that there were more cases of chronic rheumatism to-day than of heart disease, tuberculosis, and cancer combined. The prospect of bringing under control a scourge inflicting so much misery and economic wastage was a hopeful one when the triumphs achieved in recent years by medical research in other fields were recalled. There was good reason to believe that this problem would be solved by persevering effort, and all would agree that the Empire Rheumatism Council was capable of undertaking the effort with energy and skill. It was representative of the medical and scientific strength of the nation, supported by many political and industrial leaders. It could claim to its credit already a fine record of preliminary work. Laboratories had been established with whole-time staffs, special research arranged in some of the schools, skilled inquirers sent to the Continent and to America to study at first hand foreign methods of investigation and treatment, and several new treatment centres instituted in Great Britain. The present position compared with that of three years ago when the Council was set up was distinctly hopeful.

LORD HORDER, chairman of the Council, moved a resolution recognizing the urgent necessity of the national campaign of research, affirming confidence in the plans of the Council, and urging the community to support it with the means to carry its aims to success. He said that from his earliest medical days on the staff of St. Bartholomew's he had been convinced that only a resolute and co-ordinated effort could find a solution to the menace of this disease. The causes must be learned in order that control and prevention might

prevail. The enemies which had to be tracked to their lairs were cunning and skilled in all the arts of camouflage, and the research side of the campaign would call for patient perseverance, but the "detectives" were keen to follow every clue. As an example he mentioned that what seemed to be a hopeful test came to them three months ago from Warsaw, and within a month scientists were at work in three British centres on its evaluation. The reports of two Research Fellows who had travelled abroad were to hand and would prove of considerable service. Much research was being carried out in hospitals and clinics into the means of treatment, but here it must be said that although incompleteness of knowledge of the causes of the disease handicapped progress, yet there were to hand for immediate use systems of treatment which if applied in the early stages and patiently pursued would save the majority of sufferers from needless pain and subsequent crippledom. In some cases, as in the Hospital of St. John and St. Elizabeth and the West London Hospital, clinics had been founded in close co-operation with the Council; in others they had come into being following the attention aroused by the Council to this menace of rheumatism. The Admiralty had asked the Council's assistance in coping with the disease in its training establishments, and in co-operation with the Naval Medical Service it had set up an important research foundation; the Foreign Office had given valuable help to the research investigations abroad, and the L.C.C. medical services, which probably had the best plan in the world for checking juvenile rheumatism, had been most helpful, as had the British Red Cross Society and several of the great hospitals. He read a letter from the Minister of Health wishing success to the Council.

Sir WILLIAM WILLCOX, one of the trustees of the Council, seconded the resolution. The Council, he said, in its constitution and working was an imperial body, with an affiliated Council in Canada, another in formation in Australia, and others expected in New Zealand and South Africa. He testified to the devoted and energetic work carried out by members of the Research Advisory Committee (composed entirely of medical men) and the other committees. Thirty or forty years ago one always regarded rheumatism as something quite different from chronic arthritis, but recent work had shown that there was a close connexion between the two conditions. The causes of rheumatism, however, were complicated, and possibly there was more than one organism at work. It was felt that if the problem of the cause of rheumatic fever were solved a great advance would have been made towards the solution of the problem of chronic rheumatism and arthritis. Encouraging progress had been made and the time was near when the problem of acute rheumatism would be solved.

The resolution was put to the meeting and carried.

FIRST-AID POSTS IN LONDON

PROGRESS IN ORGANIZATION AND RECRUITMENT

The Minister of Health, Dr. Walter Elliot, has now approved schemes submitted by eighteen of the twenty-eight metropolitan boroughs in the County of London and by the Corporation of the City of London for the establishment of first-aid posts. These schemes provide for 131 fixed aid posts, five cleansing stations, and thirty-four mobile units. The estimated total of fixed posts required for the County of London is approximately 200. The recruitment of personnel for these posts is also progressing rapidly. In addition to one doctor to be appointed by the local authority, each fixed aid post needs on an average sixty auxiliary volunteer helpers. The total number of women auxiliaries required for the metropolitan boroughs and the City of London is thus about 12,000, and over 17,000 women have already come forward as volunteers for this work. In several boroughs, such as Chelsea, Fulham, and Lambeth, the numbers of women enrolled are considerably in excess of those necessary. The number of men volunteers required is in all 2,591, and of these 2,257 have already been enrolled.

The following lists show the boroughs whose schemes have been approved, with the addresses of the fixed posts in each case:

BETHNAL GREEN.—(1) Bethnal Green L.C.C. General Hospital. (2) Mildmay Mission Voluntary Hospital. (3) London Chest Voluntary Hospital. (4) Queen's Hospital for Children. (5) Hereford Street M. and C. W. Centre. (6) Queen Adelaide's Dispensary, Pollard Row. (7) Cornwall Avenue M. and C. W. Centre. (8) St. Barnabas Church Institute, Lanfranc Road. And one mobile unit. *Cleansing stations:* (9) Old Ford Road Public Baths; (10) Cheshire Street Public Baths.

CAMBERWELL.—(1) Bird-in-the-Bush Infant Welfare Centre, 616, Old Kent Road, S.E.15. (2) St. Giles Hospital. (3) Dulwich Hospital. (4) L.C.C. School Treatment Centre, 7, Hanover Park, Peckham. (5) Dulwich College cricket pavilion. (6) St. Antholin's Infant Welfare Centre, Barforth Road, Peckham Rye. (7) Newington Institution, Westmorland Road. And one mobile unit.

DEPTFORD.—(1) Mantle Road School, S.E.4. (2) Babies Hospital, Breakspears Road. (3) Goldsmiths' College, S.E.14. (4) Harton Street Health Centre. (5) Clyde Street Baths, S.E.8 (women); Clyde Street School, S.E.8 (men). (6) Deptford Park School, S.E.8. (7) Ilderton Road Baths, S.E.16 (men); Ilderton Road Baptist Hall, S.E.16 (women). (8) Monson Road School, S.E.14. And two mobile units.

FINSBURY.—(1) Royal London Ophthalmic Hospital. (2) Health Centre, Pine Street, E.C.1. (3) Risinghill Street School. And one mobile unit.

FULHAM.—(1) Guardians' Offices, Fulham Hospital, Fulham Palace Road, S.W.6. (2) West Kensington Central School, Earsby Street, W.14. (3) M. and C. W. Clinic, Parson's Green, S.W.6. (4) Western Hospital, Seagrave Road, S.W.6. And three mobile units. *Cleansing stations:* (1) The Baths, Walham Green; (2) West Kensington Central School, W.14; (3) Tuberculosis Dispensary, New King's Road, S.W.6.

GREENWICH.—(1) Miller Hospital Out-Patients' Department. (2) Seamen's Hospital, Massage and Electrotherapy Department. (3) St. Alfege's Institution, Admission Block. (4) Charlton Lane Welfare Centre. (5) Blackheath and Charlton Hospital. (6) Brook Hospital, Discharge Block. And one mobile unit.

HAMMERSMITH.—(1) West London Hospital, Hammersmith Road, W.6, Out-Patients' Department. (2) Queen Charlotte's Maternity Hospital, Goldhawk Road, W.12. (3) Holborn Estate Grammar School, Ducane Road, W.12. (4) Gaumont British Studios, Lime Grove, W.12 (part of ground floor). And two mobile units.

HAMPSTEAD.—(1) Bartram's R.C. School, Haverstock Hill. (2) North-Western Fever Hospital, Lawn Road. (3) Children's Hospital, College Crescent. (4) Kingsgate Road L.C.C. School. (5) Domestic Science School, Fortune Green Road. (6) St. John's Parochial School. And two mobile units.

HOLBORN.—(1) Royal Westminster Ophthalmic Hospital. (2) National Hospital. And one mobile unit.

ISLINGTON.—(1) Royal Northern Hospital, Holloway, N.7, Surgical Out-Patients' Department. (2) Essex Road Baths. (3) Mildmay Conference Hall (basement). (4) Arsenal Football Club Stadium (basement). (5) Caledonian Road Baths. (6) Miriam Price Coleman Day Nursery, Scholefield Road. And four mobile units.

KENSINGTON.—(1) Princess Louise Hospital. (2) St. Charles Training College. (3) St. Mary Abbots Hospital. (4) Princess Beatrice Hospital. (5) Brompton Hospital. (6) Lancaster Road Baths, W.11. (7) Our Lady of Sion Convent, Chepstow Villas. (8) British Red Cross Society Headquarters, The Limes, Holland Park Gardens. And two mobile units.

LAMBETH.—(1) St. Thomas's Hospital. (2) Lambeth Hospital. (3) King's College Hospital. (4) Belgrave Hospital. (5) South-Western Hospital. (6) Norwood Children's Hospital. And two mobile units.

LEWISHAM.—(1) St. John's Hospital, S.E.13. (2) St. Joseph's Academy, Lee Terrace, S.E.13. (3) Lewisham Hospital, High Street, S.E.13. (4) Ladywell Institution, Ladywell Road, S.E.13. (5) St. Dunstan's College, S.E.6. (6) South-Eastern Hospital for Children, S.E.26. (7) Downham Health Centre. (8) Park Fever Hospital, S.E.13. (9) Grove Park Hospital, S.E.12. (10) St. Augustine's School, Bellingham Estate. And two mobile units.

PADDINGTON.—(1) St. Mary's Hospital. (2) Paddington Green Children's Hospital. (3) Trinity Methodist Church, Fernhead Road (basement). (4) Whiteley's Factories and Workshops (basement), Redan Place. (5) (*a*) Lock Hospital or (*b*) Public Assistance Administrative Offices; (*c*) Casual Wards adjacent to Paddington L.C.C. Hospital. And two mobile units.

ST. MARYLEBONE.—(1) Middlesex Hospital. (2) Hospital of St. John and St. Elizabeth. (3) Royal National Orthopaedic Hospital. (4) National Heart Hospital. (5) Western Ophthalmic Hospital. (6) Florence Nightingale Hospital. And one mobile unit.

ST. PANCRAS.—(1) St. Pancras Hospital. (2) Highgate Hospital. (3) St. Margaret's Hospital. (4) University College Hospital. (5) Royal Free Hospital. (6) National Temperance Hospital. (7) Elizabeth Garrett Anderson Hospital. (8) Hampstead General Hospital. And two mobile units.

SHOREDITCH.—(1) Curtain Road School. (2) Crondall Street School. (3) Napier Street School. (4) Model Welfare Centre, Kingsland Road. (5) Haggerston Baths, Mansfield Street. And one mobile unit.

STEPNEY.—(1) Mile End Hospital, Bancroft Road, E.1. (2) St. Peter's Hospital, Fulbourne Street, E.1. (3) St. George's Hospital, Raine Street, E.1. (4) The London Hospital, Whitechapel, E.1. (5) The London Jewish Hospital, Stepney Green, E.1. (6) Princess Elizabeth of York Hospital, Glamis Road, E.1. And one mobile unit.

WANDSWORTH.—(1) Putney Health Centre, corner of Clapham Road and Charlwood Road. (2) Baths, Manor Street, Clapham. (3) South London Hospital for Women, Clapham Common. (4) Weir Hospital, Council's Maternity Home, Weir Road, Balham. (5) Baths, Streatham High Road. (6) Fairlight Hall, Tooting. (7) New Building (under construction) at rear of Municipal Buildings, Wandsworth, S.W.18. And two mobile units.

WESTMINSTER.—(1) Adelphi House (basement). (2) Berkeley Square House (basement). (3) Dolphin Square House (basement). (4) Kingston House (basement). (5) New Westminster Hospital. (6) Bessborough Street Welfare Centre, S.W.1. (7) Ebury Bridge Welfare Centre, S.W.1. (8) The Hospital for Women, Soho Square, W.1. (9) Infants Hospital, Vincent Square, S.W.1. (10) St. John's Hospital, Lisle Street, W.C.2.

CITY OF LONDON.—(1) Central Criminal Court (lower ground floor), Old Bailey, E.C.4. (2) Chartered Insurance Institute (basement), 20, Aldermanbury, E.C.2. (3) Bishopsgate Institute (basement), Bishopsgate, E.C.2. (4) Sir John Cass Foundation School (basement and ground floor), Duke Street, Aldgate, E.C.3. (5) Unilever House (ground floor), E.C.4. (6) St. Bartholomew's Hospital. And one mobile unit.

EMERGENCY PREPARATIONS IN THE EASTERN COUNTIES

Continuing the series of conferences which he and the Minister of Health are holding with the local authorities concerned with the preparations for civil defence, Mr. Robert Bernays, M.P., Parliamentary Secretary to the Minister, visited Cambridge on April 28 to meet representatives of the local authorities and the voluntary hospitals of the Eastern Counties.

A Reception Area for London

Mr. Bernays dealt with the place of the region in the evacuation scheme, and said that (with the exception of a few neutral areas) it would act as a reception area for London. The Ministry of Health was looking to the Eastern Counties to provide base hospitals in which prolonged treatment could be given to casualties and to which patients could be regularly transferred from London. The region had, of course, its own risks to provide against, and the first object of the regional scheme was to ensure adequate provision for dealing with local casualties. For this purpose there was already good hospital accommodation in most of the populous areas. The provision of accommodation for casualties transferred from danger areas was more difficult. It had to be provided on a very large scale—and provided in the rural districts where there were no large general hospitals. The Ministry had, Mr. Bernays said, for this reason to look mainly to public assistance institutions and mental hospitals. The Arlesly Mental Hospital was to be used as one of the main base hospitals for London. Other mental hospitals in the region would provide room for casualties by rearranging their ordinary accommodation. But accommodation on this scale would not be sufficient, and arrangements were well advanced for the erection of huts, where possible around existing institutions, to take 40,000 beds in England and Wales. Half of these had already been allocated; the remainder were being allocated at present, and the Ministry would shortly be approaching the local authorities and the voluntary hospitals in the Eastern Counties for this purpose.

Equipment and Supplies

Dealing with equipment and supplies for hospitals and first-aid posts, Mr. Bernays explained that the bulk would be purchased centrally for reasons of economy and convenience; 100,000 bedsteads and mattresses, 220,000 stretchers, 500,000 blankets, and 200,000 pillows had already been ordered and were being distributed—also drugs and dressings calculated to suffice for some 275,000 hospital beds for the first few weeks of an emergency, and supplies for 2,000 first-aid posts and 2,000 first-aid points. An initial allocation from this supply had been made to all scheme-making authorities for all hospitals receiving casualties in their areas; and a further allocation would follow when the amount of hospital accommodation and the number of posts and points had been finally fixed. Further orders were to be placed for 200,000 more blankets, 200,000 sheets, and 600,000 pillow slips; drugs and dressings sufficient for 1,000 additional first-aid posts; surgical instruments for 3,000 first-aid posts; and theatre and ward equipment on a scale to supply 75,000 beds.

Nursing Staff Recruitment

In conclusion Mr. Bernays spoke of the recruitment of nursing auxiliaries. It was impossible to over-emphasize the importance of recruiting the 100,000 women needed for the hospitals and the first-aid posts and of securing that they were properly trained. Without them the extensive casualty accommodation which was being provided in existing hospitals and hutted additions was almost useless. "If we can get these 100,000 auxiliaries and see them through their hospital training we shall have made the biggest step forward yet towards the establishment of an effective emergency hospital scheme."

Reports of Societies

CONFERENCE ON VITAMIN E

A conference on vitamin E, arranged by the Nutrition Panel of the Food Group of the Society of Chemical Industry, was held at the London School of Hygiene and Tropical Medicine on April 22. At the morning session, under the chairmanship of Professor A. R. TODD of Manchester, the chemistry of vitamin E was discussed. In the afternoon, with Professor J. C. DRUMMOND presiding, a discussion on the physiological action of vitamin E was opened by Dr. KARL E. MASON (Vanderbilt University, Tennessee).

Vitamin E and Reproductive Functions

Dr. Mason said that the placental transfer of vitamin E in the rat was *nil*, and mammary transfer was exceedingly limited, even when the material intake was increased to 2,000 times the minimal. New criteria of response, based upon data obtained by the post-mortem examination of assayed rats on the sixteenth day of gestation, had further shortened the assay procedure and afforded more accurate evaluation of assay results. A significant relation between the time of administration of assay doses and the response elicited had been demonstrated.

Dr. S. W. F. UNDERHILL (British Drug Houses Ltd.) pointed out that the effects of vitamin E deficiency in the rat were similar to those produced by hypophysectomy. Examination of both adult and suckling animals had shown hypoplasia of the thyroid and degenerative changes in the cells of the anterior lobe of the pituitary. Alterations in the content of gonadotropic hormone in the anterior lobe had also been observed. The administration of vitamin E would cure the paralysis observed in suckling rats, stimulate normal growth, change the soft silky fur to a normal coat, and arrest the testicular degeneration of vitamin E deficiency in its early stages. Prolonged vitamin E deficiency caused degeneration of the ovaries and uterus as well as of the testes. Vitamin E had an oestrogenic action in infantile female rats and mice; injections of anterior lobe substance caused reversal to normal of the silky coat of vitamin-E-deficient male rats. In general, however, the treatment or prevention of the effects of vitamin E deficiency by gonadal or anterior pituitary hormones had not been successful. Less emphasis should be laid on these negative results than on those that suggested a relationship between vitamin E and the anterior lobe.

Effects of Deficiency

Dr. T. MOORE (Cambridge) outlined certain investigations in which he had been assisted by A. J. P. Martin and K. R. Rajagopal. This work showed that female rats restricted to a diet deficient in vitamin E invariably developed a brown discoloration; in males the seminal vesicles were discoloured. Pigmentation was confined to the muscular layers, and was due to the deposition of small yellow granules. Later, the paralysis described by Ringsted appeared, with degeneration and slight discoloration of the affected muscles of the hind limbs. Degeneration of the epithelium of the convoluted tubules of the kidney, unaccompanied by any inflammatory reaction on the part of the interstitial tissues or of the glomeruli, was generally observed. Prolonged deficiency caused skin sores, and eventually a state of extreme emaciation and death. The lesions could be prevented by the administration of vitamin E concentrate. Curative treatment often prevented death and caused an increase in body weight, but had little effect on the uterine discoloration or the paralysis. In rats restricted to a basal diet deficient in vitamin E the administration of wheat-germ oil concentrate or tocopherol invariably resulted

in an increased rate of growth. In rats restricted to a diet deficient in vitamin E and receiving their vitamin A in halibut-liver oil, the liver reserves of vitamin A were many times greater when supplements of a commercial vitamin E concentrate were given. The question of the identity of the factor in the concentrate responsible for increased storage of vitamin A was under investigation.

Miss A. M. COPPING and Professor V. KORENCHEVSKY of the Lister Institute discussed the effect of a vitamin-E-deficient diet on the weights of organs of male and female rats. Examination of the weights, both actual and calculated per 100 grammes body weight, of sexual organs, thyroid, hypophysis, thymus, adrenals, liver, kidney, heart, and spleen from rats deprived of vitamin E from birth, and from control animals receiving the same basal diet as the deficient rats but with an adequate vitamin E supplement, indicated certain distinct changes in the vitamin-E-deficient group. The final body weight and the gain in body weight were less and the fat deposition was smaller in the deprived animals. In the deficient males the testes were smaller and the thymus was larger in both sexes than in the controls. In other organs the variations in actual weights between deficient and control animals were sometimes great, but when the weights were calculated per unit of body weight the differences disappeared in most cases and were even reversed for some organs.

Mr. A. L. BACHARACH (Glaxo Laboratories Ltd.), considering the biological estimation of vitamin E, drew attention to the high error of this type of test and gave examples of both self-consistent and inconsistent results caused by the practical difficulties of using adequate numbers of test animals. These difficulties were enhanced by the absence so far of a standard preparation for the purposes of assay. All figures given in the literature for comparative vitamin E potencies and for tocopherol contents, when the tests had been carried out biologically, should be regarded as approximations only. The concept of biological activity was itself only a provisional one, and must be replaced by quantitative data in terms of the concentration of physiologically active constituents.

Clinical Applications

Professor F. J. BROWNE presided over the third session, when the clinical and veterinary uses of wheat-germ oil and vitamin E preparation were discussed.

Dr. P. VOGT-MÖLLER (Copenhagen) surveyed the therapeutic employment of vitamin E in clinical medicine, human and veterinary. Mention was made of the results obtained by the treatment of barren cows with wheat-germ oil. In cases of non-infectious barrenness (true sterility and early abortion) the treatment gave favourable results in 75 per cent. Wheat-germ oil had also been tried in cows suffering from infectious abortion, but it was not yet practicable to say anything definite about the possible effectiveness of the treatment in such cases. Treatment of sterile sows with wheat-germ oil had given favourable results in about 70 per cent. of cases. The effect on bulls with testicular hypofunction had generally been negative, and the same applied to the treatment of aborting mares.

In human medicine vitamin E had proved very valuable in the treatment of habitual abortion, favourable results being recorded in from 75 to 80 per cent. of the cases treated. Furthermore, treatment with vitamin E seemed also to have been effective in several cases of threatened abortion and in premature separation of the placenta, as well as in certain cases of toxaemia of pregnancy. On the other hand, the treatment appeared to be ineffective in primary and secondary sterility, amenorrhoea, different forms of menorrhagia, dysmenorrhoea, genital hypoplasia, and in the treatment of climacteric phenomena. In a very few cases of irregular glandular hyperplasia a favourable effect had been obtained following the administration of vitamin E, but the results had been negative in cases of hypogalactia and in testicular hypofunction.

Studies of the excretion of pregnandiol during the vitamin E treatment of habitual abortion might help to clear up the doubtful relation of vitamin E to progesterone. Professor Vogt-Möller concluded by saying that vitamin E therapy might prove useful in the treatment of some neurological lesions; a few examples of such treatment were cited, but the results were uncertain. Vitamin E therapy had also been tried in a few cases of cancer and in acute leukaemia, but here the results had been quite negative.

Dr. E. V. SHUTE (University of Western Ontario) said that a deficiency of vitamin E might be detected by a test of the oestrogen–vitamin E equilibrium of the blood. When the vitamin E content was low or the oestrogen content high the serum protein displayed a transient inhibition of digestion by trypsin. The oestrogenic substance involved had not been identified. Deficiency of vitamin E must be very common in the non-pregnant. It was seen in pregnant hypothyroid patients and in cases of abortion or accidental haemorrhage. The outstanding and earliest sign evinced was uterine tenderness, developed at the placental site. Haemorrhagic toxaemia was associated with vitamin E deficiency, and therefore with a high blood oestrogen content. This type of case had to be differentiated from the true eclamptic type with low blood oestrogen; the therapy obviously must be diametrically opposite.

Wheat-germ oil as a source of vitamin E should be fresh and preserved cold. Very large doses might be needed, particularly for hypothyroid cases. Dosage had to be varied with the season of the year, the progress of the pregnancy, and perhaps with the monthly cycle of the patient. A study of 150 patients treated with wheat-germ oil was analysed. There was no success with cases of habitual abortion, but 68 per cent. of success with cases of threatened abortion and miscarriages. Lactation was aided in 42 per cent. of thirty-one women. Some observations on the correlation of vitamins E, B_1, and C were presented. In 107 cases of threatened abortion collected from the literature there were 5½ per cent. of congenitally deformed children delivered. Probably iron medication should be avoided in patients needing vitamin E during pregnancy.

Habitual and Threatened Abortion

Mr. D. W. CURRIE (Leeds) gave details of ninety-five cases treated with a wheat-germ oil concentrate, alone or in association with progesterone, for habitual abortion. Such treatment led to 80 per cent. of living births (of which 8 per cent. died); there were few complications. An even higher percentage of full-term pregnancies was obtained from similar treatment in cases of threatened abortion. Eight cases of habitual abortion were treated by Dr. Iles; all produced living babies (one premature).

Dr. C. R. MACDONALD (Sheffield) said that the cases he had treated with wheat-germ oil concentrate were divided into three groups: Group I, patients who had previously had two or more spontaneous abortions; Group II, patients who had had one previous spontaneous abortion; and Group III, cases of threatened abortion and ante-partum haemorrhage. In Group I there were eighteen pregnant women who, before treatment, had had collectively fifty-three pregnancies, resulting in five living infants. Following the exhibition of vitamin E they were delivered of seventeen living infants, only one patient aborting. In five cases progesterone was given in addition to wheat-germ oil, and in two arsenical therapy. Vitamin E did not prevent the occurrence of late pregnancy toxaemia. Pregnancy in an additional five patients now under treatment was progressing normally beyond the twenty-eighth week. In Group II two out of four patients were delivered of living infants and three at present under treatment had reached the seventh month of pregnancy. Of nineteen patients in Group III nine were delivered of living infants, in four the pregnancy was continuing, and six aborted (including one case of vesicular mole). In conclusion,

Dr. Macdonald raised the question of the advisability of exhibiting massive doses of vitamin E in cases of early pregnancy bleeding, on the grounds that were a vesicular mole present its growth might be further stimulated by increased production of anterior pituitary hormone, which was already present in excess in the circulation.

CANCER OF THE BREAST

At a meeting of the Manchester Medical Society on April 5 Mr. H. H. RAYNER opened a discussion on the treatment of cancer of the breast.

Mr. Rayner began by recalling a statement made to him some twenty-five years ago by a senior surgeon of that time to the effect that in the course of thirty years' practice he could not remember one patient with breast cancer who had been cured by operation. Possibly that was an unduly pessimistic observation, but it did bring home to us that real progress, mainly as the result of the adoption of the radical operation, had been made. The results of modern surgery showed that of the patients operated on for early cancer of the breast (Stage 1) from 50 per cent. to 80 per cent. survived at least ten years. Any satisfaction arising from the contemplation of this improvement must be tempered by the fact that of all the patients submitted to the radical operation, in only about one-quarter to one-third was the condition in an early stage. Very probably the proportion of early cases was much smaller than this twenty years ago; the slowly growing appreciation among women of the significance of a painless lump in the breast and a diminution of the dread of surgical operations were factors tending to increase the proportion of early cases.

The fact remained that in a proportion of cases there was no visible or palpable change in the breast perceptible to an observant woman until the tumour was far advanced—for example, a deep-seated growth in a firm and well-developed breast would commonly betray no evidence of its presence until an obvious enlargement of the axillary lymph glands attracted the patient's attention. The descriptions of the physical signs in most of the students' textbooks were much too stereotyped, for several clinical types could be recognized, of which the one just mentioned was but one example. So, too, the method of dealing with the suspicious lump in the breast, which was very important, deserved more consideration than it usually received.

Results of Operation

The accepted grouping of cases into three stages was described; this allowed comparison with different methods of treatment, but to do this at all safely other details—of which the histological type of growth, as an index of the degree of malignancy, was important—were essential. In his own series of 128 patients operated on before 1928 it was noticeable how much better the results were among the patients who lived on the south side of Manchester than in those who lived on the north side, but in view of the small size of the series it would be very unwise to regard this as more than the play of chance. Mr. Gordon-Taylor's recently published results were quoted as being specially noteworthy for the very efficient follow-up of the patients after operation, for the large number of patients, and for the excellent results. Of his 113 Stage 1 patients 84 per cent. survived at least ten years. Mr. Rayner mentioned his own series of 128 radical operations, in all of which cases the diagnosis was histologically confirmed. Forty-five were Stage 1 patients; of these, fourteen (31 per cent.) were known to have died from cancer within ten years of operation. Eight of these were patients in whom the original growth was situated in the extreme inner periphery of the breast, overlying the sternal edge. Of the eighty-three Stage 2 and Stage 3 patients sixty-two (77 per cent.) had died from cancer within ten years; of the nine known survivors several had lived for much longer periods and were to-day apparently free from cancer. Not all the deaths, say, within ten years of operation, were due to recurrence, hence the difficulty in giving results in a simple form.

Value of Radiation

Dr. RALSTON PATERSON said that although surgery was the dominant method of treatment in carcinomata of the breast radiation (radium and *x* rays) also had a very real place. It could be used alone, with results nearly but not quite so good as those achieved by surgery alone, in cases unsuitable for the radical operation. It was the only treatment for late cases, in which it was occasionally curative and consistently palliative, and used in conjunction with surgery it definitely improved the chance of permanent cure. Radiation therapy had to be of a radical nature, a considerable reaction of normal tissue being unavoidable. In radium therapy this required an extensive implantation of the whole breast, axilla, and supraclavicular zone in continuity. In *x*-ray therapy a similar zone had to be irradiated to the limits of skin tolerance by means of "tangent" fields.

The combination of methods adopted at the Radium Institute at the present moment were: Stage 1, short pre-operative course, followed by immediate radical surgery; Stage 2, radical surgery followed by post-operative intensive *x*-ray therapy to the whole post-operative zone (axilla and neck); Stage 3, radiation first (radium or *x* rays) and amputation in the face of failure of resolution; Stage 4, radiation only. A plea was also made for the immediate admission to hospital of all early cases of breast carcinomata, and attention was called to the very real dangers of local excision or local mastectomy, except when the surgeon was prepared to proceed at once, on naked-eye diagnosis, to the radical operation.

DUST DISEASES OF THE LUNG

In a lecture on dust diseases of the lung to the Advisory Medical Committee of the Industrial Welfare Society, Dr. PHILIP ELLMAN said that the organic dusts did not in themselves cause any serious respiratory disease. Certainly in the woollen, cotton, leather, and tobacco industries catarrhal infections of the lungs were observed, and "cotton bronchitis" in Lancashire had recently received much attention, but there was no evidence of any serious lung fibrosis resulting from exposure to such dusts. The inhalation of certain inorganic dusts, on the other hand, might prove extremely dangerous from the point of view of damage to the lung—that is, progressive fibrosis. Of these harmful dusts silica and asbestos were outstanding examples. The inhalation of dust containing free or uncombined silica produced the recognized disease silicosis. Certain modified forms of silicosis occurred in coal-miners under special conditions, such as anthraco-silicosis in workers exposed to anthracite coal dust. Cummins and Sladden in 1930 had fully described this condition. Again, in haematite miners in Cumberland haematite (ferric oxide) and silica dust were found in large quantities in the lungs, and led to a modified form of silicosis referred to as siderosis or sidero-silicosis. This condition had been described by Stewart and Faulds in 1934. In contrast to the nodular fibrosis of silicosis a silicate asbestos had been shown to cause a serious industrial lung disease with a diffuse pulmonary fibrosis—namely, pulmonary asbestosis. Since 1927 many cases had been reported and the literature on the subject had become considerable. Silicate dusts other than asbestos had not been shown to be particularly harmful. In certain cases modified forms of pneumonoconiosis had resulted from exposure to a mixture of free silica and silicate dusts, and metallic dusts were harmful according to the percentage of free silica which they contained. Exposure to ordinary coal dust was not in itself harmful to the lung, but the hazard of coal dust depended on

whether or no anthracite was present. Apart from anthraco-silicosis, so-called miner's asthma, occurring in miners—for example, in the Welsh coalfields in the hard headings, where free silica dust was present and where in consequence tuberculous complication was common—there was no evidence that ordinary coal dust itself rendered the miner particularly liable to pulmonary tuberculosis.

In the early diagnosis of pulmonary tuberculosis Dr. Ellman felt that the value of a technically satisfactory radiograph far outweighed that of the stethoscope. If tuberculosis were commoner in trades where there was some volume of dust—apart from silica and asbestos—it was more probably due to lower social and economic conditions, and also to the less robust type of worker, who might frequently be attracted to such trades. As a preventive measure all large factories should have on their staff a medical officer with adequate facilities, including an *x*-ray apparatus.

In the discussion which followed Professor E. L. COLLIS said that he had himself investigated two troubles due to inorganic dust. One occurred in epidemic form among cotton weavers; it was almost certainly a mycosis and closely resembled open and early cases of tuberculosis with pyrexia; but all cases cleared up in a month or so. The other was the chronic asthma of cotton strippers, due to dust from raw cotton; it developed after years of work, and incapacitated the men, but it did not predispose to tuberculosis. New knowledge on the chemistry of silica was throwing much light on the occurrence of silicosis and giving hope for its prevention. Freshly fractured dust was more harmful than old dust. Some other dusts—for example, that of aluminium—inhibited the solubility of silica in an alkaline medium, such as that of the pulmonary tissues, and so prevented it from setting up fibrosis. Every dust and every mixture of dusts must be studied separately. Meanwhile the key to tuberculosis in industry was that the disease was infectious; hence some industries, like families, might become infected.

Local News

SCOTLAND

Honorary Consultant Advisers

Mr. John Colville, Secretary of State for Scotland, has appointed four honorary consultant advisers on the organization of hospitals in war-time. Each will advise him on matters connected with the subject in which he specializes. The appointments are: *Surgery:* Sir John Fraser, K.C.V.O., M.D., F.R.C.S.Ed., regius professor of clinical surgery in the University of Edinburgh. *Medicine:* Dr. L. S. P. Davidson, F.R.C.P.Ed., professor of medicine in the University of Edinburgh. *Maternity Services:* Dr. R. W. Johnstone, C.B.E., M.D., F.R.C.S.Ed., F.R.C.O.G., professor of midwifery and diseases of women in the University of Edinburgh. *Nervous Disorders:* Dr. James H. MacDonald, F.R.F.P.S., medical superintendent, Hawkhead Mental Hospital, Glasgow.

Stirling District Mental Hospital

The annual report of the Joint Committee for Stirling District Mental Hospital shows that at the beginning of last year there were 1,033 certified patients on the register, including 574 males and 459 females. During the year 223 certified patients were admitted, 102 were discharged, and 113 died, leaving on the register at the close of the year 1,041 certified patients. It is pointed out that owing to the large number of chronic and senile cases the discharge rate could not keep pace with the admission rate, and the position was also complicated by the number of adult mental defectives in residence. A certain number of the latter had psychotic symptoms and were suitable inmates of a mental hospital, but a considerable number were purely defective and should be in an institution for certified defectives.

Ayr County Hospital

The question of a joint hospital for the county was raised at the recent annual meeting of subscribers to Ayr County Hospital. The total ordinary income of the hospital was £13,388, while the ordinary expenditure was £15,163. The Department of Health has recommended the Hospital Board not to spend any further money on the present site but to co-operate with Kilmarnock Infirmary. A site has been offered at Doonside, near Alloway, suitable for the erection of a modern hospital, and it is estimated that a hospital of sufficient size to meet present-day needs would cost approximately £200,000. The chairman stated at the meeting that it was the duty of the boards of the two hospitals to consider this proposal carefully before coming to a final decision, and it was proposed to inquire what financial assistance might be expected from the Treasury towards the capital cost and future maintenance of a joint hospital for the county.

Lanarkshire Joint Hospitals Scheme

A joint committee of the Lanark County Council and of the Burgh Councils of Hamilton, Rutherglen, and Coatbridge has submitted to the Department of Health and the Commissioner for Special Areas in Scotland a scheme for the erection of a joint hospital at a cost of about £1,260,000. The scheme includes a general hospital of 332 beds, a maternity hospital of 135 beds, and an infectious diseases hospital of 500 beds. The cost per bed is expected to work out at £1,260 for the general hospital, £1,360 for the maternity hospital, and £985 for the infectious diseases hospital. Towards the general cost the Commissioner for Special Areas has agreed to give a grant of 55 per cent. The general and maternity hospitals are to be erected in the neighbourhood of Bellshill and the infectious diseases hospital at Muirburn.

Scottish Association for Mental Hygiene

In May, 1938, the Scottish Association for Mental Welfare and the Scottish Child Guidance Council amalgamated under the title of the Scottish Association for Mental Hygiene. The Scottish Association for Mental Welfare was formed in 1922 as the result of a request by the General Board of Control for Scotland for a voluntary body which would supervise the welfare of defectives not in institutions. This work was most successfully carried out by care committees, committees for home visitation, and employment centres throughout the country. In 1929 the work, which was confined to dealing with defectives, was extended to include mental hygiene in the non-defective community as part of a world-wide mental hygiene campaign originated in the United States. The aims of this section were directed chiefly to propaganda to increase public awareness of the problems of neuroses and early psychoses and to foster the use of psychiatric clinics. In addition, public lectures were and are being given in the larger centres by mental experts so as to spread proper information on these topics. The body was recognized by the International Council for Mental Hygiene, and in 1937 sent delegates to the Second International Congress on Mental Hygiene held in Paris. In 1934 the Scottish Child Guidance Council was formed as a separate body, and in 1938 there followed the amalgamation already referred to, as the result of which all activities concerned with mental defect, mental hygiene, and child guidance are unified under the Scottish Association for Mental Hygiene. Any interested person may join

this association; the annual subscription is five guineas; life membership two guineas; for public bodies one guinea. Further information may be obtained from the secretary, 23, Eglinton Crescent, Edinburgh.

Glasgow University

At a graduation ceremony in the University of Glasgow on April 22 Sir Hector J. Hetherington conferred the degree of M.D. upon nine graduates and those of M.B., Ch.B. upon fifty-eight graduands. In his address to the graduates the principal pointed out that for many years to come they would be passing through a period which would make an exceptional demand on the intelligence, imagination, endurance, and public spirit of the people. They should think boldly, honestly, and selflessly, for a time of change might be full of promise and also a time of opportunity. Respect for truth, justice, duty, and the rights of human personality were sovereign principles of all enduring achievement, both individual and social.

At a meeting of the General Council of Glasgow University on April 26 it was announced that as the result of a private appeal made to friends of the university a sum of £20,000 had been received within the past few months. The principal described the building programme now being carried out by the university, including a new physical training centre for the use of male students. Referring to a period of emergency, he said that the intentions of the Government were that university life and work should continue. Medicine and engineering must proceed in full force, and it was possible that the number of students in these departments would be increased. Students who for any reason were not engaged in national service would be expected to continue at their university studies, and students might be transferred from other centres to Scotland. Attention was drawn to new regulations for graduation in medicine. The University Court proposed to extend the medical curriculum for students beginning their study on and after October 1, 1939, to six years or fifteen terms, together with a vacation course. A new regulation was that students who failed to complete the first professional examination within twenty-four months after beginning medical study might be required to withdraw from the faculty of medicine. The convener of the finance committee said that the total expenditure of the university in the year 1937–8 had been £201,042. It had been necessary to obtain an additional grant of £12,000, and it appeared that the State would have to come more and more to the aid of the universities, as they might expect a dwindling of income from the private sources on which universities and other institutions had depended so much in the past.

Edinburgh Hospital Co-ordination

At a meeting of representatives from the Public Health Committee of Edinburgh Town Council and from Edinburgh Royal Infirmary various matters affecting co-ordination between the voluntary and municipal hospitals of the city were discussed. These subjects included transfer of patients from the infirmary to the municipal hospitals, co-operation regarding cancer patients, training of nurses, and the question of payment for maintenance and treatment of patients. Arrangements were made that the medical officer of health and the superintendent of the Royal Infirmary should prepare a draft scheme whereby the corporation would admit chronic cases from the infirmary to certain municipal hospitals on the understanding that a joint representation would be made to the General Nursing Council that nurses should be required to take a period of training in nursing of chronic cases as part of their curriculum, and that in the event of agreement being reached on this matter training in chronic nursing would be given to infirmary nurses at the municipal hospitals. It was agreed that the question of greater co-operation in the treatment of cancer patients should remain in abeyance until the Government's proposals in regard to the treatment of cancer were more definitely known. With regard to payment for maintenance and treatment of patients, it was pointed out that the corporation was bound by statute to charge for treatment of patients, and a scheme was suggested by which money received through the League of Subscribers to the infirmary might be made available to the corporation for maintenance and treatment of patients taken from the infirmary's waiting list. It was stated by Dr. W. G. Clark, medical officer of health, that in his opinion the large city hospitals as we knew them would in time probably be reconstructed on much smaller lines and would be utilized for acute cases only, other cases being sent out into the country where convalescent hospitals would be placed.

Royal Victoria Tuberculosis Trust

At the annual meeting of the Royal Victoria Hospital Tuberculosis Trust, held in Edinburgh, Sir Thomas H. Holland, principal of the University of Edinburgh, referred to the world's indebtedness to the late Sir Robert Philip, who first recognized the importance to the public of the discovery that tuberculosis was due to a definite bacillus. Previously tuberculosis had been regarded with fatalism as a result of uncontrollable heredity, but Sir Robert Philip went straight for measures to prevent the spread of the disease, and by getting on at once with popular measures of prevention available to everyone and easily understandable he must have saved thousands of lives. At the same time he had realized the value of bacteriological research with a view to a direct attack upon the tubercle bacillus. In the annual report attention had been drawn to the fall in mortality from 265 per 100,000 among the population of Scotland in 1887 to sixty-eight in 1938. Part of this credit was due to general improvements in standards of living and hygiene, but Sir Robert Philip's special methods had led to the development of these very conditions of life which had reduced the death rate not only from tuberculosis but from other diseases as well. There was continual pressure on the Government to increase measures of protection against colliery accidents, which caused some hundreds of deaths annually, and a still more active agitation to reduce motor accidents with some thousands of deaths annually, but the public should realize that the death rate from tuberculosis was still much greater than either of these, and those who died from this disease were chiefly at the productive age between 20 and 40. Efforts, therefore, must not be relaxed, and the work of the Tuberculosis Trust, which had been so remarkable in the past fifty years, must still be supported. Professor Sydney Smith, dean of the Faculty of Medicine, said that at present about 30,000 persons in Scotland were suffering from tuberculosis, and this showed that there was still a great field of work ahead of the Trust.

New Hospital at Fife Joint Asylum

Lord Elgin on April 27 formally opened a new hospital at Fife Joint Asylum, near Cupar, recently erected at a cost of £60,000. The new building is to be known as the Stratheden Hospital, and will accommodate about 100 patients. Lord Elgin said that the opening of such a new hospital marked a great advance, if one looked back to 1866 when the first building forming this asylum was opened. In the interval there had been a great advance in medical knowledge and in the treatment of all kinds of illness. Mental disorder was now regarded as an illness which was capable of treatment and could often be cured, and this was the reason for the opening of such a hospital. It includes an administrative and treatment block with operating theatre, male and female hospital blocks each consisting of a ward of eighteen beds and seven single rooms. On either side of these are wards of eight beds with verandas, self-contained so that in the event of an

epidemic they could be converted into isolation hospitals. At either end of the building are male and female admission blocks. Sheriff Morton, chairman of the General Board of Control for Scotland, said that in comparison with the early days of mental hospitals, in this new hospital the patients would have the elbow room which was very essential in treatment. Dr. A. G. Thomson of the General Board of Control appealed for the opening of more mental clinics to prevent serious disorders of the mind in their early stages. He said that a great mental hospital should be a centre for services to the community. Ordinary mental illnesses were extraordinarily common, and for every patient in a mental hospital there were three or four suffering from minor disturbances who were often more trouble than those actually in such hospitals. There ought to be clinics to which these people could be referred just as a general practitioner referred, for example, a throat case to a throat dispensary.

ENGLAND AND WALES

Freedom of Eastbourne for Dr. Willoughby

At a meeting of the Eastbourne Town Council, held on April 26 in the Large Assembly Room of the Town Hall, a certificate of honorary Freedom of the Borough and a resolution of thanks, engraved on vellum, were presented to Dr. W. G. Willoughby, who is retiring from the post of medical officer of health after many years of very distinguished service. Alderman Miss Hudson, in moving that the highest honour the Council had to offer be conferred on Dr. Willoughby, gave details of his career, both in peace and war, and said that the success of his work was not only what he had achieved but rather what he had prevented; thanks to his vigilance Eastbourne had become one of the foremost health resorts. The Mayor, making a presentation, said that this was a token of their best wishes and affection.

In respect of length of service Dr. Willoughby is the senior medical officer of health for any county or county borough. A student and house-physician at Bart's, he took the M.D.Lond. in 1889 and the M.D. in State Medicine in 1894. The outstanding feature of his career was the Presidency of the British Medical Association in 1931–2, for he is the only full-time medical officer of health who has held that office. Almost equal to that in his own estimation is the goodwill of the medical profession with whom he has worked so long at Eastbourne and which is now culminating in a handsome presentation. Besides being a Past-President of the B.M.A., Dr. Willoughby has been President of the Society of Medical Officers of Health and of the Medical Officers of Schools Association, and he had the distinction of receiving the Fellowship of the Royal Academy of Medicine in Ireland. His war service also stands out conspicuously: after serving in Egypt he became malaria officer in Macedonia, and eventually acting A.D.M.S.Sanitary of the 12th Army Corps. His many friends in all parts of the world will be glad to know that he is in good health and hopes to continue many of his activities and still serve the profession and the community.

Lowest Maternal Mortality Rate on Record

The Minister of Health, Dr. Walter Elliot, in the course of an address at a luncheon of the Industrial Welfare Society on April 28, said that he had just received the provisional maternal mortality figures for 1938 and that they showed a further reduction from 3.13 per 1,000 births in 1937 to 2.97 in 1938. This was the lowest figure ever recorded in this country. Although the Government had now to find abnormally large sums for defence, this, as the Chancellor of the Exchequer had pointed out in his Budget speech, did not mean any reduction in social services. The Government's contribution to these services and to the cost of police, roads, etc., had grown by £186,000,000 since 1925. In addition to the new low record in maternal mortality we could point, during the period 1927–37, to a fall in the infantile mortality rate from 70 to 58, and a fall in the tuberculosis death rate from 97 to 69. The toll of sickness upon industry remained, however, very great. The gross total expenditure on benefits under national health insurance amounted in 1937 to £28,000,000. Industry had its own part to play in dealing with this problem, and he was glad to know that many hundreds of firms to-day had appointed doctors, nurses, and other experts to watch over the health of their staffs. This preventive work was of the greatest value. Enlightened employers were keen to keep abreast of every development in the scientific and medical field, and he called their attention to a problem of fractures which had been the subject of an inquiry by an Interdepartmental Committee, whose report was shortly expected. Encouraging progress had already been made in the provision of up-to-date facilities for the treatment and after-care of fracture cases.

Coroners' Inquests in London

During 1938 coroners in London held inquests on 3,063 cases out of 8,907 deaths reported to them. There were 594 cases of suicide, fourteen of them in persons under 21 years of age, but well over half of them in persons over 50. Post-mortem examinations were made in 86.2 per cent. of the inquest cases, and in 66.6 per cent. of those in which it was decided that no public inquiry was necessary. The number of people who met their deaths by accident was 1,593; thirty-nine deaths resulted from injury, and fifty-five from drowning. Inquests on newly born children numbered thirty-three, and of this number twenty-four deaths were found to be due to want of attention at birth. Excessive drinking was the cause of seventy-nine deaths.

Correspondence

Protection of Aid Posts and Casualty Clearing Stations

SIR,—It has been shown by the official Hailey report that the universal construction of bomb-proof shelters to resist a direct hit is an impossibility owing to the great financial outlay, and also the time factor involved. The average building, however, can be protected against the effect of splinter and blast even in target regions. I am anxious to ascertain what precautions have been taken in London and other large cities for the protection of the patients and staff in the smaller hospitals which are to be used as casualty clearing stations, and in the first-aid posts where the immediate treatment of the wounded is to be carried out.

It is quite possible that casualties may have to remain in these centres for a much longer time than is contemplated owing to the difficulties and delay in procuring transport, or to the blocking of the roadways by falling masonry and debris. In the extensive bombardment of a city the blocking of streets and the difficulties of access to the casualty posts require very serious consideration on the part of those responsible for the care of wounded civilians. This matter does not seem to have received universal consideration, however, as a number of the smaller hospitals have little or no protection and yet have been listed as casualty clearing stations. I know

of one where an inspection took place and the defeatist opinion was expressed that it was "useless to try to make it safe owing to the height of other buildings in the vicinity, which, if struck, would be bound to topple over the hospital."

The protection of civilian casualties has received more attention in Continental cities, where underground cellars have been strutted and equipped with operating rooms, independent water and electric light supplies, and also with air filters. Some I have seen have been constructed with comparatively little expense. Arrangements have been made for the medical and nursing staffs to take up duty immediately on the outbreak of war. The names of those chosen for duty are already posted upon the wall. Special arrangements are also made for the treatment of gassed patients. It is a matter of extreme urgency that these casualty centres should be established and protected in every large town and dangerous area. In London a number of large commercial firms have organized their own first-aid posts in protected basements for the use of their staff, and these are extraordinarily well equipped. The same precautions ought to apply to those buildings which are to be directly under the supervision of the medical profession. Care should be taken that these posts should not be invaded by panic-stricken crowds, and also that several exits are provided. Equipment such as picks and shovels should be at hand in case of the complete blocking of exits by falling masonry.—I am, etc.,

London, W.1, April 25. A. LOUISE MCILROY.

Gas Masks in the Operating Theatre

SIR,—I can give some information which may be helpful with regard to the use of gas masks in the operating theatre from experience gained during the last war.

The war diary of a certain field ambulance on the Western Front states:

"The A.D.S. (Advance Dressing Station) at Voormezeele (near Ypres) was severely shelled on the night of 23/24 July, 1917: one gas shell burst at the entrance to the dressing station and filled the underground cellars and dug-outs with gas and caused a few slight casualties in the unit. Dressers and wounded had to wear their gas masks continuously for several hours. Some of the less severely wounded were dressed in the open, and this was afterwards found to be more advantageous to both parties (wounded and dressers), in spite of darkness and intermittent shelling of the village (mostly levelled to the ground)."

I was in charge of the A.D.S. at the time mentioned, and those of us working there found it very fatiguing and difficult to carry out extensive dressings necessitating the lifting and moving of wounded men, so much so that our work tended to slow down and become less efficient. After working under these conditions for about two hours I issued orders for all the wounded to be dressed in the open, and thenceforth we transferred the trestle operating tables and equipment outside, and were able to work more expeditiously and in far less discomfort to both wounded and dressers. The gas masks used at this time had a clip to compress the nostrils and a rubber tube (unnecessarily large) which passed into the mouth and was liable to induce salivation. The present-day service gas mask is less unpleasant to wear, but would offer the same difficulties to a smaller extent by hampering respiration and obscuring vision.

There must be others who had a similar experience and could offer Mr. Rowlands some suggestions on this problem.—I am, etc.,

F. COLEMAN, *M.C.*, M.R.C.S., L.D.S.

London, W.1, May 1.

Plaster Bandages

SIR,—To ignore Miss Forrester-Brown's letter (April 22, p. 847) might be an injustice to Professor Böhler, whose hospitality I enjoyed in Vienna. During my visit, however, I did not observe a wooden box similar to that which was illustrated in the *Journal* of April 8, but noticed that his assistant made the bandages on the lid of a box which he held in a sloping position. Thus far I must plead guilty, perhaps, to following his ideas, and extend my apologies to him for having adopted the idea of the sloping board. I would join issue with Miss Forrester-Brown in the matter of producing uniform bandages, and have no doubt that her method is as satisfactory, but the advantage of the box is that it is always ready and a bandage can be made in an extremely short time.

Comparing the bandages used by Professor Böhler with those used in this country, the first difference is that he uses a very much cheaper form of plaster than we do, and although his bandage may appear crude it is true to say that it is constant in weight and composition. Using, as we do, a higher-grade plaster, it is possible by a suitable technique to make plaster cases very much lighter than is possible with the cheaper grades. Finally, I personally do not think that anyone should be asked to make plaster bandages with a trowel or other method without the use of gloves, as the deleterious effects on the hands are well known, and not many have a skin tough enough to withstand these effects for long.—I am, etc.,

Bath, April 26. CHARLES KINDERSLEY.

Treatment of Fractures

SIR,—Of recent years the responsibility for the treatment of fractures in voluntary hospitals in provincial towns has been, or is being, placed in the hands of hyper-specialized surgeons. The junior house-surgeon who used to deal with fractures had one advantage: he was in a position to receive advice from everyone in the hospital, advice coming from many different schools of thought, from which, if only he experimented long enough, he could evolve his own particular system. We now have men with high degrees, but trained in only one particular school, often more thoroughly in the theory than in the practice. Is it not possible that they are working at a disadvantage almost as great as that under which the junior house-surgeon worked?

As everyone who has seen and dealt with large numbers of fractures (by that I mean thousands) must feel, there is as yet no published routine of treatment for every possible type of fracture which, in every instance, gains better results than every other method. The results of Böhler's methods of treating fractures of the lower leg and lower two-thirds of the femur are so far unsurpassed. But his treatment of fractures of the humerus, radius, and ulna proves to be slightly more complicated initially, and no more certain of results eventually, than the McMurray system of splints and pressure pads for the first fortnight, followed by a padded plaster.

In many voluntary hospitals dependent to a large extent on subscriptions from works there is a desire to improve the treatment of works injuries and thus reduce the immense sums paid annually in compensation by their chief subscribers. With this end in view they decide to have a "fracture clinic" and to obtain a really good man to start and run it. There is at present only one criterion of a "good man"—higher surgical degrees or diplomas. But does the possession of a higher degree or diploma of

necessity prove that a man is a surgeon in the true sense of the word? Even less does it prove that such a man has the other and varied abilities necessary for such a post. For he must also be an organizer (a faculty not easily acquired) and must have a business mind (rare in medicine), so that efficiency and economy may both be served. His practical knowledge must cover every detail, so that the nurses, secretaries, and even the porters may quickly learn their new duties. Can the hospital, embarking on a new and expensive venture, be assured that their new key man has a working knowledge of every method of treatment? I doubt it.

There are in this country several large and well-established fracture clinics, each with its own routine, peculiar to itself. Could not these routines be examined and placed into groups? Then those men desiring a higher degree in orthopaedics could be compelled, as a necessary preliminary to their examination, to work in at least two clinics, the methods of the one being as widely different as possible from the methods of the other. The amount of pure orthopaedics is small and will get smaller; the demand for traumatic surgeons is increasing and their field is immense. Could there not be more practical training on these lines and less of the multitudinous theories of pure orthopaedics?—I am, etc.,

A. HENRY GREGSON, M.B., Ch.B.

Wilpshire, Lancs, April 15.

Procaine Infiltration for Sprains

SIR,—Dr. G. Douglas Gray has raised a very interesting point in his criticism of Leriche's theory of a sprain (*Journal*, April 15, p. 795), and I hesitate to enter into controversy over it. It is possible that there is an actual minute rupture of fibres as a result of the injury, but the literature on the experimental study of sprains would seem to be rather scant. I am very interested in the mechanism of a sprain and am at present engaged in an experimental study of sprains—the results of which I hope to give in a later paper. I have succeeded in producing a modified syndrome of a sprain by injecting irritating substances into the anterior cruciate ligament of the ankle-joint, and, although it is too early yet to say what the results will show, so far as they go they would seem to indicate that a purely mechanical explanation is not the whole story, as the syndrome can be produced without actual injury or "twisting" of the joint. With regard to Dr. Gray's objection that there is a risk of subsequent weakness in the joint treated by procaine infiltration, all I can say is that in my experience, admittedly short, the patients so treated have subsequently led an active, athletic life, with no signs of weakness in the treated joints.—I am, etc.,

Tangmere, Sussex, April 17. E. J. MOYNAHAN.

Pellagra

SIR,—The case of pellagra reported by Drs. J. G. Greenfield and J. MacDonald Holmes in the *Journal* of April 22 (p. 815) will serve to draw attention to a disease which, as they remark, is rare in Great Britain and may pass unrecognized. Its rarity is again emphasized in your annotation (p. 833). This I believe to be due in part to the fact that perhaps only some small proportion of cases are published. During last year pellagra supervened in the last stages in two patients with chronic abdominal disease dying in my own wards. During the same period, through the courtesy of members of the staffs of other hospitals, I have had the opportunity of seeing three or four other cases, none of them published, and twelve cases have been diagnosed in the mental hospitals of this country. There are a number of other points upon which it is perhaps worth while laying emphasis.

1. The close resemblance of one case to another among children—the case recently described presents a picture almost identical with that shown by a child under my own care (*Quart. J. Med.*, 1934, **3**, 211) and others.

2. The fact that only one out of a family of six children living under the same conditions was affected. This selective incidence is not uncommon in pellagra, but has never received the attention it deserves. This selective incidence is, of course, not negatived by the fact that several members of a family may be attacked, as in the cases described by Box in this *Journal* (1914, **2**, 397) or as noted recently by Mainzer (*Acta med. scand.*, 1939, **99**, 262), who records the occurrence of pellagra in 23-year-old twin sisters, the other members of the family escaping. These and many other facts which have been discussed elsewhere (*Trop. Dis. Bull.*, 1937, **34**, 183) suggest that as was pointed out many years ago, there is, besides an extrinsic factor, some second intrinsic factor involved in the aetiology of pellagra.

3. The paucity of post-mortem findings—especially the absence of lesions in the bowel and suprarenal; for while it is true that ulceration in the bowel and haemorrhagic lesions in the suprarenals may occur as terminal events in pellagra, they are no part of the disease itself, as some writers have inferred. On the other hand, the presence of well-marked gastritis has for the present writer a particular significance in view of the theory of causation he has put forward.

4. The question of the relation of the histo-neurological changes described to the symptoms exhibited during life. It has been pointed out previously that the nervous and mental symptoms may vary markedly, even from day to day. In the present case the change for the better after only two weeks' treatment was quite extraordinary in spite of gross changes in the central nervous system as revealed by histological examination. Had the child not unfortunately died of bronchopneumonia I think one would have expected, under appropriate treatment, continued rapid improvement. Would any alteration in the demonstrated neuronic degeneration have taken place *pari passu*? It seems doubtful. Are the conditions not probably very similar to those met with in the so-called polyneuritis of pigeons, wherein the birds may be cured of their symptoms in half an hour by a dose of vitamin B_1, but the changes in the nervous tissues persist? In the case of the pigeons the vitamin acts as a catalyst in the metabolism of glucose in the nervous tissues; in the case of pellagra is it not probable that some analogous metabolic upset occurs? What, then, is the relation between the pathological lesions found in the nervous system and the symptoms exhibited by the patient?

5. The lesions actually found by Dr. Greenfield serve to show, when compared with those described by other authors, that in pellagra the changes in the nervous tissues may vary considerably. This fact was pointed out by the late S. A. Kinnier Wilson (*Proc. roy Soc. Med.*, 1914, **7**, 31), who examined material from a number of my own cases and gave an excellent description of the changes met with.

—I am, etc.,

London, W.1, April 22. HUGH S. STANNUS.

Mumps Complicating Chronic Pancreatitis?

SIR,—In your issue of April 15 (p. 774) Dr. A. Wilson Russell records a case of mumps as a possible complication of chronic pancreatitis and carcinoma of the ampulla of Vater occurring in a patient of 77. I think, however, that in the light of the evidence put forward the probability of the parotitis being a terminal and pyogenic one must be seriously considered. In old age mumps is a very unusual infection, it is rare in adults in the absence

of a history of contact, and it is also rare as a terminal infection. On the other hand, terminal pyogenic parotitis due to the *Staphylococcus aureus* is far from uncommon in old age and in debilitated and other conditions associated with dehydration and imperfect mastication. In the case now recorded the post-mortem examination showed a small annular carcinoma at the ampulla of Vater, associated with chronic interstitial pancreatitis. There is no note of any histological or bacteriological examination of the parotids. Clinically the patient showed a stomatitis and injection of the orifices of Stenson's ducts, but there is no report on the parotid saliva.

The clinical resemblance between many cases of pyogenic parotitis and mumps is incontestable. During life differentiation must rest upon the results of cytology and bacteriology of a catheter specimen of parotid saliva, and after death upon the results of the histology and bacteriology of the parotid glands. The term "mumps" is still often used clinically and descriptively of bilateral swellings of the parotid rather than in its exact scientific sense as an infection involving the salivary glands or other structures, and caused by a filter-passing virus. I have had on so many occasions to examine these doubtful cases of mumps—and in many cases the patients have even been sent to fever hospitals more than once with a diagnosis of mumps—that I should hesitate before regarding the case quoted by your correspondent as one of proved mumps when the available evidence would so strongly suggest that the condition was pyogenic in nature.—I am, etc.,

REGINALD T. PAYNE, M.S., M.D., F.R.C.S.

London, W.1, April 24.

Nutrition and the Tuberculosis Report

SIR,—May I express my agreement with the letters of Dr. G. T. Wrench and Dr. Eric Townsend in the *Journal* of April 29 (p. 895). Dr. Wrench's *Wheel of Health* and the "Medical Testament" are the two most absorbing and significant documents which I have read for a long time. They differ from the recent Welsh tuberculosis report in the value of the remedies they offer, for they make out a convincing case for food as the one prime necessity for health. Housing and drainage are secondary, desirable but not essential.

The tuberculosis report seems to recommend the expenditure of vast sums on housing and drainage. In that it reflects the lay mind and (I say it with respect) that of the public health services. It fails to insist that the prime necessity for health is proper and adequate food, and seems to disregard the Stockton-on-Tees experiment. We probably cannot attain the perfection of the Hunza system in our industrialized country, but an extension of the allotment system, the full utilization of urban sewage for cultivation, and, above all, a system of subsidy which would make the necessary foods both the cheapest and the most conveniently obtained, would go far to secure the physical foundation without which the National Fitness Campaign is a mockery.

The facts of disease which the medical officer gleans from his statistics we learn from the experience of our daily toil, and the frustration which we meet in attempting to cure the poorly nourished breeds a deep conviction that no less than revolutionary changes are necessary to bring food to the hungry. The farmer cannot be blamed for adopting the grazing methods which pay him; it must be made profitable for him to produce the crops necessary for health.—I am, etc.,

GRIFFITH EVANS, D.M., F.R.C.S.

Caernarvon, April 29.

Emergency Tracheotomy

SIR,—As one who formerly had a long experience in fever hospitals I would like to point out that no special apparatus is needed for a tracheotomy, whatever the indications may be. All that is necessary is a sharp scalpel, the left forefinger, a tracheotomy dilator, and a tube—for adults size 26, for children 22 to 24. No anaesthetic is needed.

The left forefinger is placed on the lower edge of the cricoid cartilage. In children this cannot always be felt, but the lower edge of the thyroid cartilage always can. An incision one inch in length is made, and the left forefinger is placed on the cricoid cartilage. At this stage this can always be felt. Keeping the forefinger in position a stab incision is made from below upwards through the first two rings of the trachea. In tiny children it may be necessary to incise the cricoid. The crucial point of the operation is that the forefinger shall be kept in the wound until a tracheotomy dilator is inserted. This being attained, no hurry is necessary. Once the trachea is dilated, haemorrhage ceases and free respiration ensues. A suitable tube is inserted, but a large catheter will serve if a metal tube is not immediately obtainable. Except for novocain infiltration of the skin, an anaesthetic is not necessary or advisable. If a tracheal dilator is not available the incision in the trachea can be dilated by insertion of the handle of the scalpel and turning it sideways. Under no circumstances should a dissection be adopted. This considerably increases the haemorrhage and is quite unnecessary.

For emergencies, a tube with a hole at the bend is desirable but not essential. It has the advantage of enabling the patient to use his voice by blocking the external opening with his finger.—I am, etc.,

A. KNYVETT GORDON.

London, W.C.1, April 28.

SIR,—With reference to Mr. W. F. Fedden's letter in the *Journal* of April 29, I know of no description of any particular appliance available in this country. As I was quoting from a translation of an article in the *Deutsche Militärarzt (Monatsschrift für die gesamte Wehrmedizin)*, December, 1938, I am not sure if the word "appliance" was strictly correct, or whether the term "emergency tracheotomy 'set'" would not have been better.—I am, etc.,

J. M. WEDDELL.

Royal Army Medical College, London, S.W.1, May 2.

Chronic Mastitis

SIR,—Mr. H. J. B. Atkins, in his lucid paper (April 29, p. 866), defines "chronic mastitis" as "a state of epithelial proliferation of the mammary ducts with—in some instances—cyst formation." For this definition he quotes Sir Lenthal Cheatle, but in an address published in the *Journal* of January 3, 1925 (p. 5), Sir Lenthal advocates abandonment of the term "chronic mastitis" in favour of "a (local or diffuse) hyperplasia of the breast tissues." Clearly, if there is no inflammation, it is a breach of the convention to refer to the condition as an "-itis." The point to decide is whether any cases of "chronic mastitis" are inflammatory or whether all are hyperplastic. Mr. Atkins lays stress on the fibroblastic reaction which he has found to be an outstanding feature of the microscopical picture. Is not this fibroblastic reaction invariably and necessarily preceded by an invasion of leucocytes?—a "chronic granuloma," as Mr. Atkins names it? Such a leucocytic invasion has been described—as by Dr. A. Paine (*Lancet*, 1920, **2**, 693). Mr. Atkins

defines chronic mastitis clinically as "a painful nodular breast." Many nodular breasts are not painful, not even tender on pressure, yet I feel that these should be classed as "chronic mastitis"; and I hold that these earliest cases of chronic mastitis would, if examined microscopically, show no gland-cell proliferation and no excess of fibrous tissue, but merely a leucocytic invasion.

All who have made a study of chronic intestinal stasis (Arbuthnot Lane's disease) have noted with the greatest constancy that the breasts of "toxic" patients are granular or nodular to the feel, whereas in healthy non-toxic subjects the breasts are smooth. The granular change is felt first and worst in the upper and outer quadrant of the left breast. In neglected cases it spreads to the whole breast, and in a similar manner to the right breast. This is so constant that we are accustomed to use it as a measure of the degree of stasis and of the success of treatment. In a successfully treated case of stasis, as the toxaemia clears up the breasts lose all granularity and become smooth and healthy, as in normal women. This could hardly occur if there were already established in the breasts the proliferative process described by Sir Lenthal Cheatle or the fibrous-tissue accumulation described by Mr. Atkins. In long-standing stasis the breasts may be coarsely nodular and may contain cysts; yet even these more seriously affected breasts may clear up completely and become quite smooth after the successful treatment of the stasis. May not the changes in these apparently severely affected breasts be confined to leucocytic nodules and distension of alveoli? In neglected stasis a stage is undoubtedly reached when the breast changes described by Sir Lenthal Cheatle and Mr. Atkins have occurred. We believe these to be the cases that go on to breast cancer, the most common site being the upper and outer quadrant, where the first granularity due to stasis is produced.—I am, etc.,

London, W.1, April 29. ALFRED C. JORDAN.

Schizophrenia

SIR,—I was very sorry not to be able to get up to London to hear Professor C. G. Jung when he gave his address on the psychogenesis of schizophrenia reported in your issue of April 15 (p. 787). On reading the report I was disappointed that no mention was made of the cardiazol treatment of schizophrenia in Professor Jung's remarks. It appears to me that any attempt to explain the aetiology of this condition, whether on somatic or psychological grounds, is bound to contain some consideration of the effect of this drug. Though I cannot claim any expert knowledge of schizophrenia, I have used cardiazol on such cases, and also in cases of hysteria, and the remarkable return to mental clarity (even though it may be temporary) appears to suggest that the schizoid syndrome must in some way be associated with somatic changes which are reversible. It is certainly very dramatic to see a patient who one day is completely disoriented and apprehensive with ideas of impending death, the following day showing a perfectly recovered mental stability. Whatever the rationale of the treatment one cannot help speculating on the possibility of the reopening of association tracts which have been gradually losing their function owing to a biophysical change, the result either of somatic or psychological factors. This is pure speculation, and perhaps one of your readers with much more extensive knowledge of this mysterious syndrome may be tempted to suggest an explanation as to why a convulsion should, as it were, "jerk" a patient back to normality. At any rate this aspect must be taken into account in any attempt to discuss the aetiology of this condition.—I am, etc.,

Sheffield, April 20. E. FRETSON SKINNER.

Emulsifying Agents for Skin Protectives

SIR,—I have read with great interest the recent article and correspondence concerning skin protectives. I agree with Dr. F. A. E. Silcock (*Journal*, March 4, p. 474) that the time has come for the application of the new emulsifying agents and bases now available to medical use. The properties of self-emulsifying waxes described by Dr. P. B. Mumford (February 11, p. 266) are specially suited to the production of skin protectives and are an admirable example of the new materials. A new emulsifying agent which has recently come to my notice is of such unusual type and properties that I thought it might be of interest to some of your readers. This is a special form of aluminium hydroxide jelly which has been rendered inert and is insoluble in acids and bases; it is capable of emulsifying practically all liquids immiscible with water. The inert nature of this emulsifying agent makes possible the blending of electrolytes, and other materials usually incompatible with oils, in stable, homogeneous emulsion. Thus it is possible to add lead or aluminium salts to oil emulsions stabilized with this material without effecting any physical or chemical change. Skin protectives made with this material may be adjusted to any desired *p*H value. Inert aluminium hydroxide is also capable of wetting out solids such as sulphur, which are normally difficult to wet, and such solids can then be incorporated in the emulsions. Because of its very great sedimentation volume per unit weight, this alumina is also capable of retaining solid substances in suspension. Calamine suspensions prepared in this way remain homogeneous over long periods and spread excellently on the skin. By the use of recently developed products such as I have just mentioned, new and superior salves, ointments, and cosmetics can be compounded.—I am, etc.,

ALEXANDER KING, M.Sc.

Colloid Laboratory, Imperial College of Science, London, S.W.7, April 25.

Admission to Hospital

SIR,—The story told by "Specialist" (April 29, p. 900) surprises me not at all. His patient's impression was current, I believe, at least five years ago, and while no credence must be given to rumour unsupported by fact, it would be foolish to assume hastily that there were no grounds for the belief in such a case as this. If the impression is held by the poorer classes so much the worse, as they constitute the majority.

Standards of conduct have fallen in recent years, and a small proportion of our profession has not escaped participation in the general decline. Only two or three weeks ago a Norwich correspondent recounted in the *Journal* the lengths to which an eminent surgeon proceeded in his attempt to gain election to the Council of the Royal College. We would be well advised to speak out much more openly among ourselves when such behaviour is brought to light, avoiding thereby the charge of apathy or, worse, complicity. Reticence enables the evil-doer to continue in his ways unchecked by general opinion, and probably gives encouragement to those who find pleasure or profit in passing on to the public highly damaging and exaggerated accounts of professional life.—I am, etc.,

London, S.W.15, May 1. T. G. FAULKNER HUDSON.

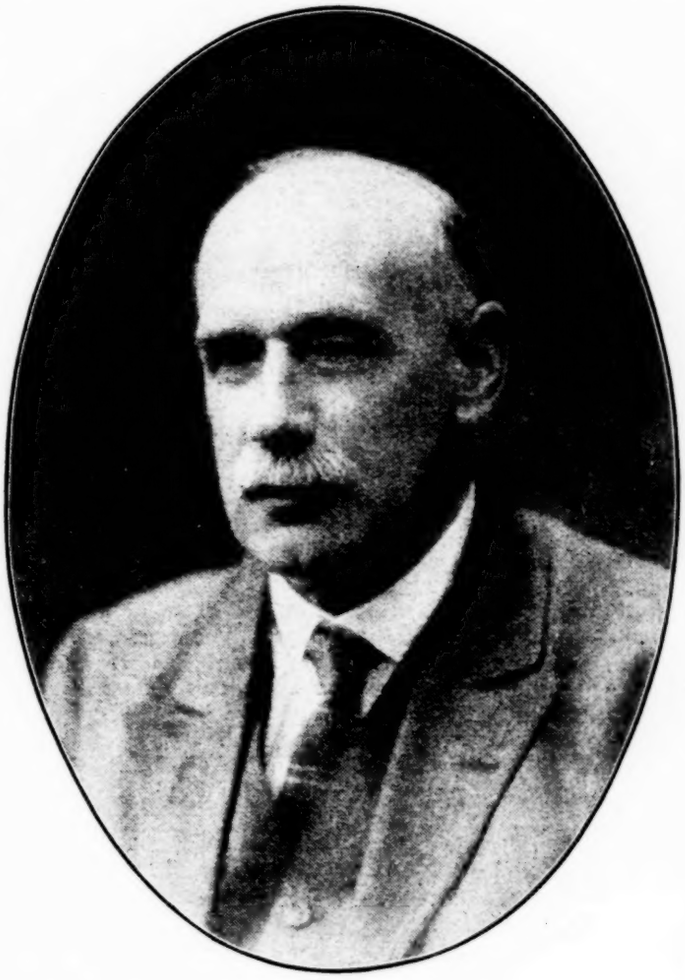
Obituary

SIR ROBERT BOLAM, M.D., F.R.C.P.,

Hon. LL.D.Glasgow, Hon. D.C.L.Dunelm

Former Vice-Chancellor, University of Durham; former Chairman of Council, British Medical Association

We deeply regret to record the death, which took place suddenly at his home in Newcastle-upon-Tyne on April 28, of Sir Robert Bolam, Chairman of Council, British Medical Association, 1920–7, and Vice-Chancellor of the University of Durham, 1936–7. He was in his sixty-eighth year.



Robert Alfred Bolam was the son of a Newcastle chemist; he was educated in Newcastle, married a Newcastle lady, and spent the whole of his professional career in the Tyneside city. With the work of the Royal Victoria Infirmary, Newcastle, he had been associated for forty years (during the last eight years as consulting physician to the skin department), and he had served the University of Durham in many capacities as teacher and administrator. It was as representative for Newcastle that he entered into the central work of the British Medical Association, and as representative of the University of Durham that he sat on the General Medical Council in recent years, though he first became a member of that body on his election as a direct representative for England.

Having qualified in medicine in 1893, he went on to take the M.D. of his University in 1896, gaining the gold medal. He then spent a brief period in London, where he worked in the physiological department of King's College under the guidance of his friend, Professor W. D. Halliburton. On his return north he was appointed demonstrator of physiology in the department in which Sir Thomas Oliver was then lecturer. He quickly showed his administrative gifts by completely reorganizing the pathological museum of the medical school at Newcastle. For a time he was physician to the Children's Hospital and assistant physician and pathologist to the Royal Victoria Infirmary. In 1907 he became the first honorary physician in charge of the skin department of the hospital, and this post he held until his retirement under the statutory age limit of sixty in 1931. An illuminated address was presented to him by the House Committee referring to the valuable services he had rendered during twenty-four years. Many plans for the extension and improvement of the department originated in his fertile brain.

In the University Bolam filled from time to time many important and responsible positions, including that of lecturer in dermatology, professor of medical jurisprudence, and long membership of the Senate. He was made Pro-Vice-Chancellor in 1931, and served as Vice-Chancellor in 1936–7. In 1934, in succession to Sir Thomas Oliver, who had held the post for eight years, he was elected President of the University College of Medicine. He was at all times an admirable teacher, with the gift of interesting others in the subjects in which he himself was interested, and his genius for organization and administration found scope in many directions. He combined a faculty of vision with a grasp of practical detail. In the controversy of a few years ago regarding the control of the medical college at Newcastle he was, of course, a prominent figure. The controversy led to an official inquiry and eventually into the merging of the Armstrong and Medical Colleges into the present King's as part of the Newcastle Division of the University of Durham. Another local professional activity of his in addition to a busy specialist practice was the editorship of the *Northumberland and Durham Medical Journal*, to which and to the *British Journal of Dermatology* he occasionally contributed papers on dermatological subjects. He was a corresponding member of the Société Française de Dermatologie. He was vice-president of the Section of Dermatology at the B.M.A. Annual Meeting in 1912, and president in 1928.

During the war he served as major and acting lieutenant-colonel R.A.M.C.(T.F.) in the First Northern General Hospital, and was mentioned for distinguished service and awarded the rank of brevet lieutenant-colonel and the O.B.E. (Military). His special sphere of service was as commanding officer at the Wingrove Hospital, which was the venereal diseases department of the First Northern. After the war this clinic, under the Ministry of Health, was merged with the skin department at the Royal Victoria Infirmary, and Bolam was in charge of both. Indeed, he remained in charge of the clinic for some time after his retirement from the department.

Work for the British Medical Association

A man of such administrative gifts was destined for a wider field than a regional one, however important, and

Bolam found it in the central affairs of the British Medical Association. He had joined the Association two years after qualifying, and remained a member for forty years, resigning in 1935, not because of any differences, personal or political, but because, becoming more and more engrossed with the affairs of the General Medical Council, on which body he occupied an executive position second only to that of the President, he found his membership of the Association an occasional embarrassment. The late Sir Donald MacAlister, the President of the Council, had found the same difficulty, and resigned from the Association, though his relations with it continued to be most friendly.

Sir Robert Bolam first became a representative in 1913. He was president of the North of England Branch in 1921, in which year the Association held its Annual Meeting in his own city of Newcastle under the presidency of his old teacher, Sir David Drummond. In the business affairs of the Association he quickly made his mark. He gained the ear of the Representative Body by his shrewdness, persuasiveness, and ability to straighten a tangled situation. He revealed himself as an adept in the art of compromise, meaning the ability to reconcile different views each of which had something worth establishing. He became a member of the Council in 1915, and during the war years was a hard-working member of the Central Medical War Committee.

In 1919 he joined the Journal Committee, remaining a member of it for sixteen years; during the latter part of the time he was its energetic chairman. Here his business sense showed itself to great advantage, and his understanding of the technical and administrative problems of journal production was highly appreciated both by the late and present Editors. As the late Editor, Sir Dawson Williams, once said of him: "It was not long before we found that he was determined, even though he lived at the other end of the country, to enter into all our troubles and difficulties, and we came rather to think that if Dr. Bolam, after he had understood a particular difficulty, made little of it, we, the officials, had been making too much of it." He was also for the long period of fourteen years a member, and at one time chairman, of the Hospitals Committee, and took a prominent part in the hammering out of the Hospital Policy which occupied successive Annual Representative Meetings in the early 'twenties. Another part of Association work with which his name will be for long identified was the framing, with the Society of Medical Officers of Health, of satisfactory salary scales for public health appointments, and the means of persuading local authorities to adopt them.

In 1920 he became Chairman of Council in succession to Dr. J. A. Macdonald of Taunton. He was elected for the usual three years, and then re-elected for another three, and only his insistence that he could serve for but one more year after his second term prevented him from equalling his predecessor's record, which was ten years. The Chairmanship of Council, as anyone with the slightest knowledge of Association affairs is aware, means much more than presiding over quarterly meetings. It is comparable with the post of chairman of directors of a big corporation. It was a constant source of wonder to his friends how, during the seven years of his chairmanship, he managed to live a dual existence, carrying on his active practice in Newcastle and attending to multitudinous duties in London. He became the most frequent night traveller on the London and North-Eastern Railway, but he would arrive at King's Cross in the morning "as fresh as paint" and carry through a day of quite exhausting labours. Of the businesslike grasp he managed to maintain on all matters, great and comparatively small, matters of policy and matters of routine, his colleagues of those years and the staff can testify.

The New Buildings

It was during this period that the Association transferred its headquarters from the Strand to Tavistock Square, and began a building policy which at this very moment is changing the aspect of the part of London to which it removed. This was much more than a question of taking more commodious offices; it was significant of the growing strength and influence of the Association in public affairs. It was on Sir Robert Bolam's initiative that the main block of the present building, then partly completed for another purpose, was discovered, acquired on advantageous terms, and altered and embellished by the architect, Sir Edwin Lutyens, P.R.A., to meet Association requirements. His name rightly appears first on a stone tablet near the entrance recording the services of the Building Committee. In every detail of the work he showed himself, what he was often called, a master builder. It was he, with Dr. Haslip, who carried off the Council in motor coaches to visit what was then a rather derelict spectacle in Bloomsbury, and he who inspired them with the possibilities which such a home offered to the Association.

The culmination of his efforts was reached at the Royal opening of the new House in July, 1925. It fell to his lot to read the loyal address of the Association to King George V, and to show their Majesties round the building. He showed how admirably he could handle an ornamental as well as a business occasion. It does not often happen that the sagacious business man is also the graceful orator, but no one could do better justice than Bolam to the ceremonial occasions which fell to his lot or make a more happy speech at a public dinner. He had the sense of the fitting word. Many will recall apparently extemporaneous efforts of his which made the audience feel what a fortunate thing it was that the Association should have at its head a man so gifted. One such happily phrased speech was delivered on the occasion of the retirement of his friend, Dr. C. O. Hawthorne, from the Chairmanship of the Representative Body in 1931. In the chair he was a model of patience; he understood, as someone said of him, the alpha and omega of chairmanship, the alpha being to restrain any member from monopolizing the debate and the omega to refrain from monopolizing it himself.

At the Annual Meeting which followed the Royal opening he was presented with the Gold Medal of the Association. One passage from the illuminated address read: "A sagacious counsellor and a wise and courageous leader; possessed of a most persuasive personality and the gift of inspiring affection as well as respect." In 1926, to the pleasure of all his friends, and indeed the entire Association, he received the honour of knighthood. At a complimentary dinner given to him by his fellow members of Council he spoke of the fineness of the Association ideal, and quoted the words which Kipling had used about something very different: "The game is more than the player of the game, and the ship is more than the crew." He said that he had striven after an ideal beyond his accomplishment, but of which he hoped to grasp the skirts. At the Edinburgh Annual Meeting in 1927 he carried the Representative Body with him in the large plan for future extensions of B.M.A. House, which is now entering its second and final phase.

The General Medical Council

Bolam entered the General Medical Council in 1920, being returned at the top of the poll in the election of direct representatives for England. In 1928 he became representative there of Durham University. He quickly made his mark in Hallam Street. One of his first interventions was to occupy the Council for the best part of a whole morning (in 1922) concerning insidious forms of advertising by practitioners, which were then not infrequent. He came armed with a parcel of newspaper clippings illustrative of this questionable practice, as he deemed it—such, for instance, as the announcement in a paid obituary notice that Doctor So-and-so had been attending the deceased. He succeeded in getting a resolution through the Council which has led to a stricter discipline on its part with regard to such matters. The work of the Council was of a kind particularly suited to his gifts, and he presently took a position of high authority in it, becoming Chairman of Business, and it is no secret that he would probably have been made President of the Council on the forthcoming retirement of Sir Norman Walker.

Such a review leaves unmentioned many pieces of work to which Robert Bolam from time to time put his hand on behalf of his profession. His membership of the Consultative Council to the Ministry of Health on Medical and Allied Services was greatly valued in Whitehall. He was the Association's nominee on the Voluntary Hospitals Commission, on the governing body of the British Postgraduate Hospital and Medical School, and on the Court of Governors of the London School of Hygiene and Tropical Medicine. His chairmanship of the Departmental Committee on the Training of Midwives was also a noteworthy piece of work. He served for several years as a director of the British Medical Bureau, in which he was chiefly instrumental in acquiring an interest for the Association. He was elected F.R.C.P. in 1922, and received the honorary degrees of Doctor of Law at the Annual Meeting in Glasgow in 1922 and of Doctor of Medicine of the National University of Ireland at the Annual Meeting in Dublin in 1933. His loss will be severely felt, alike in London and in his own North Country, where some of his best work was done. He is survived by Lady Bolam and by a son (Dr. R. Mason Bolam, who practises in Newcastle) and two daughters. The funeral service took place on Tuesday of this week at Holy Trinity Church, Jesmond, and the burial at Jesmond old cemetery. The Council of the British Medical Association was represented by Professor R. J. Willan, Dr. James Hudson, Mr. A. Hedley Whyte (hon. secretary, North of England Branch, B.M.A.), and Dr. H. F. Wattsford (hon. secretary, Newcastle Division, and member of Central Council).

Sir Henry Brackenbury writes:

Under the immediate shock of the news of Bolam's death I can think not of his wonderful activities in connexion with the British Medical Association and the General Medical Council but only of his personal friendship. To me this has been an abiding comfort and support during many years, and now, while its memory will endure, it is suddenly withdrawn as a living force. There are many readers of the *Journal* who know what his friendship has meant, and those of us who have enjoyed it must befittingly acknowledge his real sympathy in times of trouble and his practical helpfulness in positions of difficulty. With him one felt that one was always sure of these, and that out of the abundance of his wisdom and kindness he would ever be ready to give whatever he could. The value of his public work, great as it has been, is at the moment quite outbalanced by the weight of such gifts of personality and manifestations of character as those which I have indicated. My words are inadequate. I ought, however, to say something about his more public activities in the interest of causes or of bodies and institutions with which he was connected. I was closely associated with him in some of these, and can bear emphatic witness to the untiring energy, the sincere zeal, the thoughtful wisdom which he invariably brought to bear upon them, and the great sacrifices of time, comfort, money, and in some cases popularity which he made on their behalf.

During the long period that he was a member of the B.M.A. Council Bolam's influence on its policies and activities was very great, and his leadership during the seven years that he was its Chairman was both powerful and successful. He worthily extended the influence of the Association in several directions. His mere physical expenditure in its interests is noteworthy, for, living in Newcastle-upon-Tyne, for many weeks in each year he spent two or three nights in the train travelling to and from London. His influence as a member of the General Medical Council, and latterly as its Chairman of Business, was likewise very great, and it is difficult to estimate the extent of the immediate loss which that body must feel and experience. Of his work in the reorganization of the University of Durham, and as its Vice-Chancellor, I cannot speak from the same personal knowledge, but on each of these three organizations he has left a personal mark for good. It is probably in these connexions that his memory will longest endure, for those who have learnt to know his personality and to love his friendship will in their turn pass away; but it is this personality and this friendship which must just now be overpoweringly in the minds of those who knew him well.

Dr. C. O. Hawthorne writes:

The name of Robert Bolam is written firmly in the modern history of the British Medical Association, and those of us who were more or less closely associated with him have many reasons to remember with gratitude his devotion and service as well as his personal courtesy and good will. Alike in high office and in routine duties he made a large contribution both to the material and to the social and medico-political developments which have characterized the growth and activities of the Association in recent years. It will be for the official record to tell the full story, including a tribute to the courage and resolution which led to the establishment of the new Home of the Association in Tavistock Square, and a recognition of the unstinted time and thought which Bolam gave to this and other purposes of the Association. Here may be added a personal word in appreciation of two qualities which were large factors in determining his influence and success. First he was a very shrewd and sagacious counsellor, and, in addition, he possessed in a very special manner the art of quiet persuasiveness. Making no attempt at dramatic or rhetorical appeal, he argued his policy as a matter of plain common sense and essential reasonableness, and he used this fashion with striking success whether addressed to an individual or to an official group or to a crowded audience. Quite content to listen unperturbed to the other side, and not hardened against compromise in forms or phrases, he never allowed himself to be diverted from his main purpose and from what he regarded as the heart and essence of the debate. In conference, in negotiation, in

the presentation of a policy, he carried this practice of efficient statesmanship to a high level, and the occasions are not few in which the exercise of these qualities gave to the Association permanent and valuable advantages. Bolam took his triumphs very quietly; they did not necessarily command wide recognition, but by his responsible colleagues their value was fully appreciated.

To those of us who knew him well Bolam's death is grievous news. It means the close of an association carrying many grateful memories. His in high degree was the appeal which commands affection and loyalty and comradeship, and while he was quite frank in criticism and even in opposition, his sincerity and sureness and good fellowship made his friendship a valued, abiding, and helpful possession. *Ave atque Vale.*

We announce with regret the death of Dr. ARTHUR ROSS BOYD at his home, Holywell House, Antrim, on April 18. Dr. Boyd had for seven years been resident medical superintendent of County Antrim Mental Hospital, and previously had been deputy medical superintendent of the County Mental Hospital, Powick. A native of Ballymena, he was educated there at the Model and Grammar Schools. He matriculated in the Royal University of Ireland, gaining honours in his first and second Arts examinations. On entering Queen's College, Belfast, he was awarded two scholarships, and during his medical course he held the gold medal for diseases of women and children and the Malcolm Exhibition, and finally graduated M.B., B.Ch., B.A.O., with first-class honours, in 1908. After qualifying, Dr. Boyd was appointed house-surgeon to the Royal Victoria Hospital, Belfast, and then in 1909 he entered the mental hospital service. Throughout his life he was a keen sportsman, taking a special interest in cricket, badminton, and tennis. In his illness he showed true courage and unselfishness. He was a friend of all with whom he came in contact. Attentive and sympathetic to his patients, he was greatly beloved by all his colleagues. His death will come as a great sorrow to his many friends and acquaintances.

The sudden death on April 19 of ALFRED CARLETON WILLIAMS in his sixty-third year came as a great shock to his colleagues and friends. After a distinguished career at King's College, during which he was Junior Medical Scholar, Warneford Scholar, and Sambrooke Exhibitioner, Dr. Williams qualified M.R.C.S., L.R.C.P. in 1901. He took the D.P.H. in 1910. He was clinical assistant at Victoria Park Chest Hospital and the Princess Elizabeth of York Hospital for Children, Shadwell, before joining the public health service of the London County Council as a whole-time officer in 1911, in which capacity he spent the rest of his professional life. He took up the study of mental and physical defects in children, and was soon to become a recognized expert in the diagnosis of mental deficiency and the administration of the appropriate Acts of Parliament. With the late Dr. F. C. Shrubsall he was co-author of a standard work on the subject, *Mental Deficiency Practice*, and he was author of many papers and reports on the combined defect in children, etc. He was promoted Divisional Medical Officer in the London County Council's service; he was also vice-president of the Medical Officers of Schools Association, and lecturer in mental deficiency administration to the London University Postgraduate Courses and the School of Hygiene. In his difficult subject he was a brilliant clinician, whose help and advice were ever at the disposal of his colleagues, by whom he will be sadly missed. Outstanding qualities in a man of the highest character were his honesty of mind, his dry sense of humour, his modesty, and his approachability.

We regret to announce the death on April 21 of Dr. TIMOTHY FRANCIS HEGARTY, who was one of the best-known and most popular members of the medical profession in Cork. A native of that city and a descendant of an old Cork family, he received his early education at the Christian Brothers College, Cork, and graduated M.B., B.Ch., and B.A.O. of the National University of Ireland from University College, Cork, in 1911. For a few years after graduation he practised in Wales, and on the outbreak of war in 1914 he joined the R.A.M.C. Special Reserve with a temporary commission; he served in France until he was demobilized in 1919, and was mentioned in dispatches. He then started practice in Cork, and was for some years visiting physician to the local prison. Dr. Hegarty had been a member of the British Medical Association since 1912, was assistant honorary secretary of the Munster Branch for over eleven years, and president of the Branch in 1927–9. He was a representative for Munster at the Annual Representative Meetings in London, Eastbourne, and Dublin, and a member of the Irish Committee of the B.M.A. from 1934 to 1936.

The death occurred on April 22 of Dr. JAMES FORSYTH CRAIG of Hagley Road, Edgbaston, one of the oldest medical practitioners in Birmingham. He was born at Duncanstone, Aberdeenshire, in 1858, and graduated M.A. of the University of Aberdeen in 1881, taking the M.B. and C.M. degrees in 1884 and proceeding later to the M.D. In 1884 Dr. Craig went to Birmingham, where his father and uncle were already in practice, and took up the post of resident surgeon to Perry's, the famous firm of pen makers, and in the following year joined the British Medical Association. Later he practised in partnership for many years, and became Divisional Surgeon to the Birmingham City Police, a Post Office surgeon, and public vaccinator. He was a past-president of the Birmingham and District General Medical Practitioners' Union and of the United Kingdom Police Surgeons' Association. Two of Dr. Craig's brothers, three nephews, and one son have been medical practitioners in Birmingham.

Dr. FRANK CORNER, J.P., died at his residence in North Kensington on April 22, aged 77. He was the eldest son of the late Francis Mead Corner, M.R.C.S., J.P., and came of a Yorkshire family which has contributed many of its members to the medical profession. Frank Corner qualified M.R.C.S., L.R.C.P. from the London Hospital in 1888 and practised for many years in East India Road, Poplar, as his father did before him. He had been resident surgeon at the Poplar Hospital for Accidents, and medical officer of the Bromley Sick Asylum. He had many cultured tastes outside medicine; palaeontology, anthropology, geography, prehistory, and family history were among his hobbies. In his day he was the captain of the London Hospital Football fifteen and also of the United Hospitals. He was mentioned in dispatches for services in the R.A.M.C. during the war. One of his younger brothers is Mr. Edred Corner, F.R.C.S., consulting surgeon to St. Thomas's Hospital; his uncle was Matthew Corner, M.D., and the late Dr. Cursham Corner, J.P., was his first cousin. Frank Corner retired from practice many years ago, and had been in failing health for some time.

Dr. DOUGLAS SEATON, a well-known member of the Leeds medical profession, died on April 24 at his home in Headingley, aged 69. He was educated at Leeds Grammar School and the old Yorkshire College, graduating M.B., Ch.B. of the Victoria University, with honours, in 1894. After qualifying he served as resident surgical officer, casualty officer, and house-surgeon at the General Infirmary at Leeds. He then began general practice and became honorary surgeon to the Leeds Public Dispensary, honorary anaesthetist to the General Infirmary, and visiting surgeon to the Cookridge Convalescent Hospital. Dr. Seaton joined the British Medical Association in 1900, and was for many years a member of the Leeds and West Riding Medico-Chirurgical Society. One of his two sons is in practice at Leeds.

Universities and Colleges

UNIVERSITY OF OXFORD

At a Congregation held on April 27 the following medical degrees were conferred:

D.M.—R. Pakenham Walsh, J. G. Johnstone.

UNIVERSITY OF CAMBRIDGE

At a Congregation held on April 29 the following medical degrees were conferred:

M.D.—*A. C. E. Cole, *C. G. Pantin, W. H. G. Jessop, E. J. M. Bowlby.
M.CHIR.—D. L. Lewis, W. G. Gill.
M.B.—*J. Hale, H. A. Hamilton.
* By proxy.

Walker and Foster Studentships

Applications for a John Lucas Walker Studentship are invited, and should be sent before July 10 to Professor Dean, at the Department of Pathology, to whom requests for further information regarding the studentship may be addressed. The studentship will be tenable for such period, and will be of such annual value not exceeding £300, as the Professor of Pathology with the approval of the Managers may determine.

Candidates for the Michael Foster Studentship in Physiology should send their applications, with a statement of the course of research they propose to undertake, to Professor Adrian, Physiological Laboratory, by July 7. The student receives the annual value of the fund (about £100), and may be re-elected for a second year.

Marmaduke Sheild Scholarship

The Professor of Anatomy gives notice that applications for the Marmaduke Sheild Scholarship in Human Anatomy (emoluments £100 a year) must be sent to the Registrary by May 20. The award will be made towards the end of June.

Persons eligible to the scholarship are such undergraduates of not more than three years' standing from matriculation, and such Bachelors of Arts of not more than four years' standing from matriculation, as have passed Part II of the Second M.B., or done the equivalent of so passing and have also obtained honours in Part I of the Natural Sciences Tripos with anatomy as one of their subjects. Women also are eligible. The awarders will take into consideration not only the candidates' performance in examinations in anatomy but also reports by the staff of the Department of Anatomy on their general ability and performance as students of anatomy as well in practical as in theoretical work. The scholarship is normally tenable for a year from the date of the award, but a scholar may be re-elected for a second year, whether he satisfies the rules of standing for a first election or not.

UNIVERSITY OF LONDON

The following candidates have been approved at the examination indicated:

POSTGRADUATE DIPLOMA IN PSYCHOLOGICAL MEDICINE.—(*With Special Knowledge of Mental Diseases*): F. R. C. Casson, R. W. Crocket, G. Diggle, J. J. M. Jacobs, R. Macdonald, W. Telfer, D. J. Watterson. *Part A:* D. W. Abse, W. E. Audley, Sophie Bookhalter, J. D. Uytman.

UNIVERSITY OF WALES

The following candidates have satisfied the examiners in the examination indicated:

D.P.H.—*Part I:* H. L. Ackerman, J. Paterson, I. Pugh, R. W. Thomas.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a meeting of the Royal College of Physicians of London on April 27, with the President, Dr. Robert Hutchison, in the chair, Professor Harvey Cushing was elected an Honorary Fellow.

Sir Charles Bickerton Blackburn, President, and Dr. S. V. Sewell, President-Elect, of the Royal Australasian College of Physicians, and Dr. N. Gerald Horner, Editor of the *British Medical Journal*, were elected Fellows under By-law XXXVIII (*b*).

The following Members were elected Fellows:

Hildred Carlill, M.D.Camb. (London); Walter Henry Grace, M.D.Lond. (Chester); Alan Filmer Rook, Group Captain R.A.F.M.S. (London); Isaac Jones, M.D.Melb. (London); Loswel Israel B. Braun, M.D.Lond (Johannesburg); Frederick Martin Brice Allen, M.D.Belf. (Belfast); Louis Forman, M.D.Lond. (London); Ronald Epey Lane, M.B.Lond. (Manchester); Trevor Owen, M.B.Toronto (Toronto); N. Bruce Williamson, M.D.Ed. (London); Eric Benjamin Strauss, M.D.Oxf. (London); Edward Selby Phipson, M.D.Lond., Colonel I.M.S. (Assam); Geoffrey Lawrence Samuel Konstam, M.D.Lond. (London); Ronald Edward Smith, M.B.Camb. (Rugby); Albert Victor Neale, M.D.Birm. (Birmingham); Hugh Gregory Garland, M.D.Leeds (Leeds); Cuthbert Leslie Cope, M.D.Oxf. (Oxford); John Callis Hawksley, M.D.Lond. (London); John Smith, M.D.Aberd. (Aberdeen); Hugh Crichton-Miller, M.D.Ed. (London); Rupert Samuel Bruce Pearson, M.D.Oxf. (London); Frank Patrick Lee Lander, M.D. Lond. (London); Richard W. B. Ellis, M.D.Camb. (London); William Donald Wykeham Brooks, M.D.Oxf. (London); Janet M. Vaughan, M.D.Oxf. (London); Robert Pierret, M.D.Lyons (Paris); William Allen Daley, M.D.Lond. (London); Naguib Mahfouz Pacha, M.B.Cairo (Cairo); Sir Henry Howarth Bashford, M.D. Lond. (London); William Fletcher Shaw, M.D.Manch. (Manchester); Henry Francis Moore, M.D.Dublin (Dublin).

The following were admitted Members of the College:

Alice Josephine Mary Taylor Barnes, M.B.Oxf., Amiya Kumar Basu, M.B.Calcutta, Richard Maxwell Biggins, M.B.Melb., Manindralal Biswas, M.B.Calcutta, John Henderson Bolton, M.D. Melb., Josiah Mark Bonnin, M.B.Adelaide, James Eric Clarke, M.D.Melb., William Paton Cleland, M.B.Adelaide, William Richard Shaboe Doll, M.B.Lond., William Henry de Bargue Hubert, L.R.C.P., Ralph Kauntze, M.B.Camb., George Marcus Komrower, M.B.Manch, Eliot Digby Mackworth, M.B.Aberd., Ram Prakash Malhotra, M.B.Punjab, Emanuel Miller, L.R.C.P., Robert Mowbray, M.D.Durh., Frank Haddow Scadding, M.B.Lond., John Dalrymple Willis, M.B.New Zealand.

Professor J. W. McNee was re-elected a representative of the College on the Executive Committee of the Imperial Cancer Research Fund, and Dr. Reginald Hilton representative on the Scientific Advisory Committee of the Radium Institute and Mount Vernon Hospital.

Professor W. W. D. Thomson was appointed delegate of the College to the twenty-fifth Annual Conference of the National Association for the Prevention of Tuberculosis at Belfast, June 29 to July 1.

Dr. H. Morley Fletcher reported on his recent visit to the inauguration ceremony of the Royal Australasian College of Physicians at Sydney.

Licences and Diplomas

Licences to practise physic were conferred upon the following 220 candidates (including sixteen women) who had passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board, and have complied with the necessary by-laws:

G. Ahmad, A. C. Anderson, S. C. Appleton, G. N. Arthurs, D. W. R. Ashby, J. Aspin, H. Auger, D. M. Baker, G. C. Barron, T. H. Bassett, L. S. Beizer, R. C. S. Benson, W. C. Berriman, E. B. Berry, A. C. Bingold, F. T. Birkinshaw, P. H. Birks, St. J. M. C. Birt, M. R. Blair, R. A. Blair, P. J. Blaxland, J. A. Bowen-Jones, E. S. Brawn, W. E. Bryan, M. M. Bull, N. F. E. Burrows, J. R. Caldwell, K. P. S. Caldwell, J. A. Campbell, J. Carter, P. J. R. Chalon, J. H. O. Chance, P. T. Chopping, Nancy G. Clegg, P. U. Colyer, C. A. G. Cook, E. Cook, E. L. Corsi, J. M. Couchman, H. H. Crabb, J. D. Craig, J. V. Crawford, G. R. Crawshaw, J. J. Crehan, J. L. S. Cresswell, A. P. Curtin, D. O. Davies, Dilys Ll. Davies, I. M. Davies, P. H. Davies, R. M. Davies, N. Dembovitz, R. G. Denniss, R. de Senneville, H. E. de Wardener, N. J. Dhondy, B. Djanogli, W. Donkin, J. A. Duncan, R. G. Eager, F. H. Edwards, W. G. C. Edwards, T. K. Elliott, E. M. Elmhirst-Baxter, J. F. Erskine, R. H. Evans, G. R. Fearnley, C. M. Fletcher, R. Fletcher, K. H. P. Flew, Mita Frost, J. W. Garraway, M. O. J. Gibson, J. C. Gillett, Barbara Girling, H. E. Gleave, F. S. Gorrill, R. W. G. Grindlay, L. B. Gunn, J. T. A. Hackett, R. H. V. Hafner, R. Hanbury-Webber, J. Harders, E. Y. Haroun, K. L. Hart, M. F. Hart, G. G. Hartill, C. F. Hawkins, F. A. Henley, J. Herbert-Burns, J. B. Heycock, P. F. J. Hickinbotham, A. C. S. Hobson, T. P. Hopkins, W. J. T. Howard, C. Huddlestone, C. W. A. Hughes, J. F. Hughes, J. P. Irwin, I. M. Jackson, Beryl C. James, B. A. E. Johns, Dorothy H. Johnston, R. D. C. Johnstone, A. K. Jones, Eleanor M. Jones, W. A. Jones, F. P. Kay, R. McC. Kennedy, J. B. Kershaw, R. Kershaw, R. A. King, M. H. Kinmonth, W. H. Kirkaldy-Willis, A. H. Knight, Dorothy M. S. Knott, D. B. Kulkarni, H. C. Lanchester, D. Lawrence, Mary Laws, Joyce Leach, G. Levy, J. S. Lillicrap, J. J. H. Lowe, J. N. Macdonald, G. C. Mackay, A. R. C. Margetts, R. E. D. Markillie, I. H. Marrable, G. R. Marshall, D. R. B. Mathias, R. Mawson, D. E. Meredith, A. E. W. Miles, M. D. Milne, S. Misra, J. B. Mitchell, Mary L. Mittell, S. V. Mody, N. C. Mond, Margaret J. Morgan, E. P. Morley, D. Munro-Ashman, J. Murray, J. C. H. Nicolas, F. Noronha, M. B. Oakden, A. M. Ogilvie, S. P. S. Oswald, K. Page, K. R. Pallot, L. M. Pearce, Sylvia Pearson, W. H. Peek, J. Ll. Penistan, E. A. Penn, J. H. Penrose, P. E. Perceval, Freda M. Pescatore, C. P. Petch, A. K. Pittman, M. J. Pleydell, B. Pomerantz, H. I. H. Porcher, F. Post, F. L. Potter, R. W. K. Purser, P. R. Rainford, G. J. F. Rees, I. B. Rees-Roberts, B. W. Richards, D. G. B. Richards, J. R. E. Richardson, Frances M. Roberts, J. D. Rochford, Nancy G. Rogers, E. Rosenbaum, W. H. S. St. John-Brooks, Mary Savory, S. Shaw, W. A. de C. Shearman, M. A. Shellim, V. S. Shuttleworth, M. R. J. Snelling, R. J. O. Speirs, J. R. Squire,

H. N. D. Stephens, P. S. Steptoe, A. M. Stevens, I. MacD. G. Stewart, J. E. T. Strickland, W. E. Swanston, G. Tabuteau, J. A. Taylor, E. L. Tee, J. E. Tees, J. Ll. Temple, A. S. Thenuwara, K. B. Thomas, D. H. Thompson, J. I. Timothy, B. Tongbai, E. H. Travers, D. Tumrasvin, E. W. Turner, L. H. Turner, R. S. Turner, F. H. Tyrer, H. G. Vyse, L. D. Walker, R. J. S. Walker, K. H. Walter, M. Ware, C. K. Warrick, P. Watts, J. W. S. Welbon, R. G. S. Whitfield, H. W. Whittingham, R. Wilson, P. B. Woodyatt.

The following diplomas were conferred, jointly with the Royal College of Surgeons of England, upon the following candidates:

TROPICAL MEDICINE AND HYGIENE.—A. C. E. Cole, W. G. Davidson, S. M. Desai, A. M. Dimyan, W. R. M. Drew, A. Gomez, M. Grais, H. P. Gunetilleka, A. J. Haddow, G. McN. Hargreaves, J. K. Hunter, J. S. B. Kumarakulasinghe, J. H. McDonald, Sosa Matthew, S. K. Mufarrij, K. P. G. Nayar, Hirabai B. Patil, E. P. Rigby, P. A. Shah, D. G. Snell, W. A. Thomas, S. C. Thurai-Rajah, C. M. Vanniasegaram, D. P. Viljoen, C. C. Warnesuriye, O. G. Weerasinghe, S. C. Wright.

ANAESTHETICS.—C. G. Bryan, G. Kaye, H. R. Youngman.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the requisite examinations, have been admitted L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P. and S.Glas.:

W. Anderson, G. L. Basak, S. S. Basta, C. H. Boyd, W. Briggs, A. A. Brown, Caroline M. Brown, Gertrude M. Brown, H. Chartock, C. N. Dhlamini, Fa Lun Fung, W. F. H. Gibson, L. N. Gitzelter, Phoebe T. Goggin, N. Goodman, M. F. H. Griffith, E. J. Guller, H. L. Hart, M. Kandasamy, M. Langman, F. G. Lassalle, J. Loudon, R. W. McClements, G. W. R. MacGregor, Mary P. Maclean, G. R. P. MacLeish, S. S. Molema, J. Morkan, S. G. Paletz, J. A. Perpoli, P. A. McL. Robertson, W. S. Schram, S. Siegel, H. S. V. Smith, A. Tawfic, A. Unger, B. N. Young.

The following graduates of recognized universities, having passed the requisite examinations, were also admitted L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P. and S.Glas.:

P. Baer, S. F. Berndt, W. Elkan, R. Freudenberg, Gerda Friedmann, A. A. Malik, W. Mayer-Gross, R. P. M. Regnault.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—D. H. Dracup, R. S. Holtan, J. A. L. Leeming, E. C. G. Miller, J. A. V. Shone.
MEDICINE.—N. F. Bishay, D. Macpherson, F. D. P. Palmer.
FORENSIC MEDICINE.—D. Macpherson, F. D. P. Palmer.
MIDWIFERY.—J. J. Brenner, D. Specter, W. N. Vallacott.

The diploma of the Society has been granted to J. A. L. Leeming, F. D. P. Palmer, and J. A. V. Shone.

THE FACULTY OF RADIOLOGISTS

The Faculty of Radiologists, which was formed by the amalgamation of the British Association of Radiologists and the Society of Radiotherapists, has established a Fellowship to meet the need for a higher radiological qualification; it is obtainable by examination and submission of a thesis. Fellows (who automatically include former Fellows of the British Association of Radiologists) may use the initials F.F.R. after their names. Candidates must be eligible for membership of the Faculty—that is, have practised radiology exclusively for three years—registered medical practitioners of five years' standing, and radiological diplomates of two years' standing. In 1941 and subsequently a year's general clinical work at approved hospitals will also be compulsory. They must pass an examination in radiodiagnosis and/or radiotherapy equivalent to the standard of higher academic qualifications, and an examination on a pass standard in general medicine, general surgery, and pathology, with special reference to diseases in which radiology is concerned. Candidates who have passed examinations for higher medical or surgical qualifications may be exempted wholly or partly from the latter subjects. The examination is held annually in London at the beginning of December. A thesis on some special subdivision of the candidate's radiological subject is also required, and may be presented at any time after the expiration of two years from the taking of a radiological diploma. Candidates need not necessarily be Members of the Faculty in order to sit for the Fellowship examination, but a successful candidate who is not a Member must be elected as such before he can be admitted a Fellow. The offices are at 32, Welbeck Street, London, W.1.

Medical Notes in Parliament

The Royal Assent was given on April 28 to the Army and Air Force (Annual) Bill and the Local Government Superannuation Bill, 1939.

Defective Crew Accommodation: Port Medical Officer's Duties

Dr. ELLIOT on April 27 told Mr. Ben Smith that records of nuisances and defects in crews' accommodation which were not remedied at the port of detection were kept by port health authorities. There was no general requirement as to the notification of unremedied nuisances and defects to subsequent ports of call, but where such notification was given it would usually be the practice for the medical officer of health of the subsequent port to notify the port of detection of the action taken by him and of its result. Particulars of unremedied nuisances and defects were not reported to the Ministry of Health or to any other authority except that of a subsequent port of call.

Mr. SMITH asked if the Minister would ask or instruct the medical officers to report these ships at the various ports of call, so that the proper remedies might be made effective. Dr. ELLIOT said he would consider this question in the review of the matter which the Ministry was holding.

Dr. Elliot also told Mr. Smith that the annual reports of the medical officers of health of port health districts (which included the particulars supplied by sanitary inspectors) were examined by officers of his Department. Summaries were made of some of the information contained in the reports, and notes of any exceptional information or suggestions were taken with a view to appropriate action, which might include in some cases a visit to the port by a medical officer of his Department.

Mr. SMITH asked what conditions had to be fulfilled before a port medical officer of health could record that a notice to remedy a nuisance or defect in the accommodation for the crew by a vessel had been complied with.

Dr. ELLIOT said that this was a matter primarily for the judgment of the medical officer of health, but the ordinary practice was to verify by inspection that the nuisance or defect had been remedied.

Mr. SMITH asked if the best course would not be to give powers of supervision to medical officers of health; but Dr. ELLIOT replied that these were responsible officers, and we must leave something to their judgment. Mr. SMITH: Surely there must be some overriding authority for any officer of a Department? Dr. ELLIOT: It would be greatly to the advantage of the subject which Mr. Smith and I both have at heart if he would have confidence in my Department.

Administration of "Gland Extracts"

On April 27 Mr. LYONS asked the Minister of Health whether he was aware that gland extracts from animals were being administered to football players, and particularly to the teams who were to take part in the 1939 Cup Final; and whether he would order an investigation into this practice with a view to ascertaining its effect and repercussions on national health. Dr. ELLIOT said he had no first-hand information on this matter, but the gland extracts concerned were included in the medical pharmacopoeia, and if, as he had reason to believe, they were administered under medical supervision he did not think any special investigation was necessary. If there was any specific point which Mr. Lyons wished to bring to his attention he would look into it.

Mr. LYONS: Does the Ministry of Health endorse or approve of this form of treatment? Dr. ELLIOT: Treatment administered under the supervision of a medical man is not a matter for approval or disapproval by my Department. Mr. MANDER asked if the Minister was aware that this treatment was entirely innocuous, that it had been widely administered with beneficial results as regard resistance to disease, and that the clubs con-

cerned would welcome any inquiry it was thought fit to make. No reply was given to this question.

Discussions of the Parliamentary Medical Committee

At a meeting of the Parliamentary Medical Committee on May 1, Sir FRANCIS FREMANTLE presiding, matters connected with evacuation in time of emergency, the distribution of medical personnel, and regional organization were discussed. It was decided to ask one of the regional medical organizers to meet the committee at an early date. The subject of conscription was considered, and it was agreed that the six months' training in the twenty-first year would prove most valuable for the health of the country, but that as some opposition to the measure was based on the fear that it would lead to permanent and general conscription it would be best not to say too much about the health-giving conditions which, it must be recognized, would be proved by experience. It was agreed that the question of postponing conscription when necessary for the sake of university and medical examinations would require attention. Questions arising out of the Budget which were discussed included the possible exemption of doctors' motor cars from the increased horse-power tax, and the possible exemption of photographic films for medical and scientific purposes. Consideration was also given to the surprising abolition of the tax on patent medicines, with the apparent effect that it would also do away with the incentive for publication of the contents of the medicines on the labels, which had enabled most of the better-known patent medicines to secure relief from the tax. It is hoped to raise these matters in the debates on the Finance Bill in due course.

Information was given to the committee of the composition of the subcommittee appointed by the Minister of Health to advise him on the administration of the Cancer Act, and as to the action promised by the Minister at the end of the recent debate on the nursing services. Mention was made also of the Criminal Justice Bill, now considerably improved in committee; and of the London Government Bill with regard to the disqualification of certain medical officers from membership of a metropolitan borough council. It was decided to take appropriate action on each of these matters.

Patent Medicine Duty

On May 2 Lieutenant-Commander FLETCHER asked the Chancellor of the Exchequer if he could give an assurance that the benefits of the abolition of the duty on patent medicines would be passed on to the public by reduction in the prices of the articles concerned, and that the concession would not be solely utilized to increase the profits of the proprietary medicine manufacturers. Sir JOHN SIMON replied that in evidence before the Select Committee which reported in 1937 on the Medicine Stamp Duties, one important body stated that if the duty were removed the consumer would receive the whole of the benefit. He relied on the good will of other manufacturers and vendors to follow this excellent example.

Lieutenant-Commander FLETCHER: Is it not very desirable that the repeal of this archaic tax should not result in certain individuals making larger profits than they do at present out of deceiving and gulling the public?

Sir JOHN SIMON: I am not prepared to accept the suggestion that all remedies deserve epithets of that sort, but it is certainly desirable that when a duty is abolished or reduced, so far as possible the benefit should be passed on to the public, just as is often the case when a tax is increased.

Lieutenant-Commander FLETCHER: I would point out that I referred to "certain individuals."

Fracture Clinics

Dr. ELLIOT states that seven local authorities in the United Kingdom and seventy voluntary hospitals have established fracture clinics substantially on the lines advocated in the Interim Report of the Committee on the Rehabilitation of Injured Persons.

Milk Legislation

On May 1 Sir REGINALD DORMAN-SMITH informed Mr. Price that as existing legislative provisions with respect to the milk industry expired on September 30 he hoped to introduce a further measure of milk legislation this summer. He could not yet indicate the lines of the new legislation.

Primary Vaccination during Adolescence.—On April 25 Mr. BERNAYS informed Squadron Leader Hulbert that the Ministry of Health had drawn attention to the undesirability of primary vaccination during school age or adolescence, both in annual reports and in a circular issued on August 19, 1929. The Minister of Health was considering giving further guidance in the matter, but it was difficult to see how legislation would help.

Tuberculosis as a Scheduled Disease.—On April 27 Captain PLUGGE asked the Home Secretary whether, as tuberculosis was not a scheduled disease under the Workmen's Compensation Act, and nurses who contracted this malady in the course of their duties obtained no compensation, he would consider introducing legislation to deal with the matter. Mr. PEAKE replied that the question of extending the Workmen's Compensation Act to cover tuberculosis and other diseases not specific to employment to permit of their being scheduled under the Act raised great difficulties. The matter would no doubt be raised in evidence before the Royal Commission, and the Home Secretary would not feel justified in attempting to deal with it in advance of the Commission's report.

Report on Rehabilitation after Accidents.—The Delevingne Committee on Rehabilitation of Persons injured by Industrial Accidents is considering its draft report and hopes to present it at an early date. It is not possible to say how much of the information obtained by the committee will be published.

Notes in Brief

During the year ended March 31 the factory inspectorate was increased by twenty-six, including three medical inspectors.

Eight hundred and forty-six boroughs and urban district councils have submitted air raid fire-precautions schemes; 812 have been examined and the great majority settled in principle.

Asked on April 27 whether the seamen now serving on vessels coasting round Britain had been supplied with gas masks, Sir John Anderson said that some 2,300 ships had now been supplied with these masks.

The Services

HONORARY PHYSICIAN TO THE KING

Major-General R. W. D. Leslie, O.B.E., late R.A.M.C., has been appointed Honorary Physician to the King, in succession to Major-General G. A. D. Harvey, C.B., C.M.G., late R.A.M.C., who has retired.

HONORARY SURGEONS TO THE KING

Major-General A. D. Fraser, D.S.O., M.C., late R.A.M.C., has been appointed Honorary Surgeon to the King, in succession to Major-General H. H. A. Emerson, D.S.O., late R.A.M.C., who has retired.

Colonel W. E. R. Williams, O.B.E., I.M.S., has been appointed Honorary Surgeon to the King in succession to Colonel W. J. Powell, C.I.E., I.M.S., who has retired.

DEATHS IN THE SERVICES

Major GERALD JAMES MCGORTY, M.C., R.A.M.C., died at Warrington Barracks on March 30. He was educated at Glasgow University, where he graduated M.B., Ch.B. in 1915, after which he took a temporary commission as lieutenant in the Royal Army Medical Corps, and after a year's service became captain. At the end of the war he took a permanent commission in the R.A.M.C., and became major on April 19, 1928. He served in the war of 1914–18, was mentioned in dispatches in the *London Gazette* of November 25, 1916, and received the Military Cross. He joined the British Medical Association in 1925. He leaves a widow.

Medical News

The Cantor Lectures for 1938-9 will be delivered by Professor E. C. Dodds, Courtauld Professor of Biochemistry in the University of London, at the Royal Society of Arts, John Street, Adelphi, W.C., on Mondays, May 8, 15, and 22, at 8 p.m. His subject is "Modern Chemistry, Modern Medicine, and Modern Food."

Dr. W. Randolph Lovelace of the Mayo Clinic, Rochester, Minnesota, will deliver a lecture on "The Use of High Concentrations of Oxygen and of Helium and Oxygen Mixtures" in the anatomical theatre of Guy's Hospital Medical School, London Bridge, S.E., on Monday, May 8, at 5 p.m.

A meeting of the Tuberculosis Association will be held at 26, Portland Place, W., on Friday, May 19, at 5.10 p.m., when papers on "The Diagnosis of Pulmonary Tuberculosis in the Absence of Bacteriological Confirmation: Clinical and Administrative Difficulties" will be read by Dr. J. G. Scadding and Dr. G. Ivor Davies. At 8.10 p.m. a paper will be read by Dr. T. W. Davies on "Silicosis in Slate Quarry Miners."

The Kensington Division of the British Medical Association has arranged a meeting at B.M.A. House, Tavistock Square, W.C., on Tuesday, May 23, at 8.30 p.m., when various problems associated with nutrition will be discussed. Sir John Boyd Orr will speak on "Dietary Standards"; Professor S. J. Cowell on "Immediate and Remote Effects of Imperfect Diets"; and Dr. Leslie Harris on "The Significance and Assessment of Partial Deficiencies." Dr. H. E. Magee will open the discussion. All members of the medical profession are invited.

The annual meeting of the Tavistock Clinic will be held at the Café Royal, Regent Street, W., on Monday, May 15, at 12.15 p.m., and will be followed by a luncheon.

The address to the Kensington Medical Society by Lord Horder, which was to have been given on May 10, has now been postponed to Wednesday, June 14. His subject is "The Mental Aspects of Physical Disease."

The annual oration before the London Jewish Hospital Medical Society will be given by Sir Charles Wilson, M.D., at 5, Addison Road, Kensington, W., on Sunday, May 14, at 9 p.m. His subject is "Humility." Admission is by ticket only, obtainable from Dr. Max Sorsby at the hospital, Stepney Green, E.1.

The twenty-fifth French Congress of Social Hygiene will be held at the Bordeaux Faculty of Medicine under the presidency of Dr. Georges Risler from May 19 to 27. Further information can be obtained from L'Alliance d'Hygiène Sociale, 5, Rue les Cases.

The fifth International Congress for Life-saving and First Aid to the Injured will be held at Zurich and St. Moritz from July 23 to 28. The chairman of the British Committee is Mr. Thomas E. A. Stowell, M.D., F.R.C.S., and the secretary Mr. G. L. Perry, Industrial Welfare Society, 14, Hobart Place, Westminster, S.W.1, from whom full particulars may be obtained.

The first foreign presentation by the New York City Cancer Committee of its Clement Cleveland Medal "for distinguished service to public education on cancer control" was made to Mlle Eve Curie recently in the presence of the French and the Polish Ambassadors. In accepting the award from Dr. Francis Carter Wood, director of the Crocker Institute of Cancer Research at Columbia University, Mlle Curie paid tribute to the American women who seventeen years ago gave Marie Curie "the only gift on which her heart was set—a gramme of that radium which she had given to the world for nothing and which she was now too poor to buy to continue her research work." Though her father and mother always knew science to have no morals, serving indiscriminately good and evil, yet they never lost their faith in its being an influence towards a better world. Had they had the proper equipment their work might have been accomplished in two years instead of five.

Sir Thomas Inskip, Secretary of State for the Dominions, will perform the formal inauguration of the new Burden Neurological Institute at Stoke Lane, Stapleton, Bristol, on Friday, May 12, at 12 noon.

Dr. Milian, the well-known Paris dermatologist, has been elected a member of the Académie de Médecine.

A department of physical education was established in Turkey at the close of last year.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

Notifications of practically all the infectious diseases have fallen since last week: exceptions are whooping-cough and measles in London and in Scotland; deaths from whooping-cough have risen by 1 in both London and Northern Ireland, but the figures for measles remain the same. Measles appear to be prevalent in Ireland, where there were 4 deaths during the week—all in Dublin—compared with 3 in Dublin and 1 in Limerick in the previous week. There was also an increase in the notifications of cerebrospinal fever in England and Wales—51, compared with an average for the previous four weeks of 36. London shared in the increase, the notifications for the week being 6, compared with an average of 4 for the last four weeks. The counties chiefly affected were: Lancashire 8 (Liverpool 5, Manchester 2); London 6 (Lewisham 2); 5 each in Durham and Glamorganshire (Cardiff 3); and 3 each in Devonshire, Essex, Gloucestershire, and the West Riding of Yorkshire.

Cerebrospinal Fever in Africa

During the first quarter of 1939 an increase in the incidence of cerebrospinal fever was recorded for Tanganyika and the Belgian Congo, compared with the corresponding period of 1938; in the former 174 cases, among which there were 35 deaths, were notified from the beginning of the year up to April 1, compared with 53 in 1938. In the Belgian Congo during the same period there were 102 cases and 50 deaths, including 72 cases in the Province of Coquilhatville and 21 in the territory of Ruanda-Urundi. In Uganda a decrease was recorded—54 cases (as against 106 in 1938)—and in Kenya, where 74 cases were notified (compared with 79), most of which occurred in the Central Province.

Small-pox in North America in 1938

In Canada small-pox remained sporadic during 1938, but showed a marked increase, 106 cases being reported, compared with 18 in 1937. All but two of the cases occurred in the three adjacent provinces of Alberta (33), Manitoba (25), and Saskatchewan (46). In the United States the disease prevalent was a mild variety (variola minor) with a tendency to increase. During the year 14,387 cases were reported, an increase over the average for the previous six years: the States most affected were those of the West North Central Group, where 31 per cent. of the cases were reported, the East North Central Group, 23 per cent., and the Pacific Group, 19 per cent. The case mortality of the disease was low, less than 0.4 per cent. On the other hand, in Mexico, where variola major is the prevailing type, the number of deaths from small-pox decreased progressively from 17,405 in 1930 to 3,428 in 1937, and in the towns from 638 in 1936 to 270 in 1938. The case mortality of the disease in the towns was 22 per cent. in 1937 and 15 per cent. in the following year.

Cholera in India

In Bengal the maximum seasonal incidence was reached in the first week of April and was higher this year than in the past two years. For the three-week period ended April 15 5,830 cases were notified, compared with 289 during the approximately corresponding period of 1938 and 215 in 1937. In the other provinces in which cholera is prevalent the position is satisfactory and much better than during the corresponding period of 1938.

No. 16

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended April 22, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns (125 in 1938) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)					1930-8 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	51	6	19		1	21	3	13	1	2		
Deaths		—	—				1	3				
Diphtheria	825	86	161	33	19	1,048	153	191	65	30	1,023	153
Deaths	18	1	7	2	—	30	2	3	1	2		
Dysentery	21	7	16		—	63	14	39		1		
Deaths				—	—			2	—	—		
Encephalitis lethargica, acute	5	—	—	1	—	2	—	—		—		
Deaths		1					1	—				
Enteric (typhoid and paratyphoid) fever	16	3	8	6	1	21	2	14	4	1	25	
Deaths	—	—	—	—	—	—	—	—	—	—		
Erysipelas			67	7	8			65	13	2		
Deaths		1					2	2				
Infective enteritis or diarrhoea under 2 years	33	9	10	5	6	47	11	8	2	2		
Deaths												
Measles		61	190		5			798		16		
Deaths	5	—	1	4	—	40	4	24	—	1		
Ophthalmia neonatorum	133	11	26		—	88	9	53		—		
Deaths												
Pneumonia, influenzal*	1,270	118	14	4	15	1,212	79	11	3	5	1,018	84
Deaths (from influenza)	91	9	1	1	—	56	6	4	1	—		
Pneumonia, primary			213	14				213	10			
Deaths		18		10	8		13		27	9		
Polio-encephalitis, acute	—	—				3	—					
Deaths		—					—					
Poliomyelitis, acute	8	2	1		—	3	—	—		—		
Deaths		—					—	—				
Puerperal fever	—	—	11	1	—	3†	3	23	5	—		
Deaths		—					2‡					
Puerperal pyrexia	203	16	21		1	196	24	36		—		
Deaths												
Relapsing fever	—	—			—	—	—	—		—		
Deaths								—				
Scarlet fever	1,467	121	218	69	71	1,864	175	364	106	71	1,861	210
Deaths	3	—	1	—	1	3	1	2	2	—		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—	—	—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—			—	—	—		
Whooping-cough		459	451		32			61		17		
Deaths	20	5	3	3	1	16	2	2	1	1		
Deaths (0-1 year)	337	47	64	24	20	383	67	71	28	17		
Infant mortality rate (per 1,000 live births)	52	40				64	55					
Deaths (excluding stillbirths)	4,874	891	697	214	148	4,930	945	647	184	145		
Annual death rate (per 1,000 persons living)	12.0	11.3	14.1	14.4	13.0	12.1	11.9	13.2	12.4	12.9		
Live births	7,122	1,140	974	348	321	6,672	1,303	1,111	331	259		
Annual rate per 1,000 persons living	17.5	14.5	19.7	23.4	28.2	16.4	16.4	22.7	22.4	23.0		
Stillbirths	250	36	34			268	46					
Rate per 1,000 total births (including stillborn)	34	31	34			39	34					

* Includes primary from in figures for England and Wales, London (administrative county), and Northern Ireland.

† After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

‡ Deaths from puerperal sepsis.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Air-swallowing

Mr. D. STANLEY-JONES, F.R.C.S. (Hayle, Cornwall), writes: I should much value the help of my colleagues on two cases of mine suffering from air-swallowing. Both are elderly females, inclined to be neurotic, who swallow large quantities of air, which causes marked distension of the abdomen with acute colic, retching, and vomiting. Turpentine enemas give very little relief. The principal difficulty is to prevent the actual habit which is the cause of all the trouble.

Loss of Smell and Taste

"W. N. H." writes: A lady of 65 has lost all sense of smell and taste for the past two months, following mild influenza. Her general health is now satisfactory and there is no obvious abnormality in the nose. I shall be grateful for any opinion as to prognosis and treatment.

Treatment of Sterility

"PRACTITIONER" writes: I would like to know if any colleague has actual experience in the use of any of the oestrogenic substances at present being advertised as a cure for sterility. If so, what preparation is recommended, what dosage, and what duration of treatment?

Snoring

Mr. J. H. BADCOCK, F.R.C.S., writes from Jamaica: "Perplexed's" patient (March 25, p. 655) should get his dentist to make him a "mouth-valve," and wear it at night, with the addition of a bandage to support the chin, if necessary.

LETTERS, NOTES, ETC.

Normal Temperature 99° ?

Mr. J. DUDLEY PANK, a lay administrator of the Spanish Children's Hostel, Cumberland, writes: I have read with considerable interest Dr. Edward Bevan's letter on this subject, the more so as one of the children in my charge appears to have a normal morning temperature of 99.2° F., with a complete reversal of the usual rule that the evening temperature is higher than the morning. His evening temperature is rarely higher than 98° F. No question of deception can enter into the matter, since the temperature has on each occasion been taken by myself with two thermometers sublingually. The boy is 10¾ years old, 4 feet 6¾ inches in height, weighs 5 st. 9 lb., and is strong and well built. Previous to his coming under my charge on November 1 last there appears to be nothing outstanding in his medical history, so far as he and his elder brother can remember. On December 28, 1938, he complained of pain in the left eye. The next day the eye was very swollen, with a large stye forming on the outer edge of the lid; his temperature was 100° F. In the next three days there was a gradual return to normal, with a considerable discharge of pus. It was at this period that it was found that the morning temperature invariably exceeded normal while the evening figure was subnormal, and as a result the boy was kept in bed for another five days until it was appreciated that this was apparently his usual condition. Since that time I have taken a series of readings over periods of several days and find that the figures are consistent. I have not, of course, been able to carry out Dr. Bevan's comprehensive tests, but can definitely say that the boy appears to be in a perfectly normal state of health and is as strong and active as any of his fellows. Any doctor who is interested would be quite welcome to see the boy.

Spanish Medical Refugees in France

In the *Journal* of March 18 (p. 567) we published Sir John Kennedy's report to the British Red Cross Society on his first visit to the refugee camps and hospitals for Spaniards in the Pyrenees, and further notes on his later tours of inspection have appeared in these columns (April 8 and April 22). We understand from a visitor to the Spanish camps in France that several hundred medical refugees are now living in these primitive encampments within wire fences, and would greatly appreciate small gifts and tokens of sympathy from colleagues in less unhappy circumstances. They would especially value used copies of medical journals and medical literature of any sort; also copybooks and pencils in which to record case notes; and such bodily comforts as shirts and socks, tooth-brushes, and cakes of soap. Gifts in kind for Spanish refugee doctors in the French camps may be sent to the Comité National Britannique d'Aide à l'Espagne, 47bis, Avenue de la Gare, Perpignan, France. Gifts in cash, sent to the same address, will be used in bulk purchases on their behalf. A note explaining that they are intended for doctors in the camps should accompany gifts.

Medical Peace Campaign

Dr. MARY T. DAY (honorary secretary, Medical Peace Campaign) writes: The Medical Peace Campaign has noted with approval the manifesto from the Balkan Medical Union published in the *Journal* of February 18 (p. 338). Within the medical profession there is a tradition of international co-operation in scientific and clinical matters. Is it not now appropriate that this co-operation should be extended to include discussions as to the ways in which war may be prevented? This manifesto by the Balkan Medical Union represents a beginning which, with the support of the profession in all countries, might become a vital force for peace.

A Newspaper's Apology

At the request of the manager of the legal department of the *Sunday Pictorial* we print below an apology to Mr. J. Lyle Cameron, and the Royal Waterloo Hospital for Women, which appeared in that newspaper on Sunday, April 30.

> "In last Sunday's *Sunday Pictorial* there was a reference to an action brought by a Miss Gladys Moore against Mr. Lyle Cameron, of Wimpole Street, the women's specialist, and against the Royal Waterloo Hospital. It was stated that Mr. Cameron and the hospital were being sued by Miss Moore for damages arising out of operations. It is recognized that this paragraph, which appeared by inadvertence, should never have been published, as the action against the hospital has in fact been struck out as disclosing no reasonable cause of action and that against Mr. Cameron is being strenuously contested. We accordingly desire to take the earliest opportunity of apologizing unreservedly both to Mr. Cameron and to the Royal Waterloo Hospital and expressing our sincere regret for any harm which may have been done to the reputation of Mr. Cameron or the hospital by this publication."

Disclaimer

Mr. IVOR LEWIS writes: I need hardly state that recent references to myself in the lay press in connexion with a Trendelenburg pulmonary embolectomy were made without my consent or knowledge. Moreover, the persistence shown and the ruses adopted by reporters to try and get information constituted a nuisance to the staff of the hospital, the convalescent home, and even the Royal Society of Medicine—which last they were eventually able to track down by chasing the ambulance taking the patient there!